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A SYSTEMATIC ANALYSIS OF THE SPECTRA OF TRIVALENT ACTINIDE CHLORIDES IN D_{3h} SITE SYMMETRY

by

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ABSTRACT

The optical spectra of actinide ions in the compound $AnCl_3$ and doped into single crystal $LaCl_3$ were interpreted in terms of transitions within $5f^N$ configurations. Energy-level calculations were carried out using an effective operator Hamiltonian, the parameters of which were determined by fitting experimental data. Atomic and crystal-field matrices were diagonalized simultaneously assuming an approximate D_{3h} site symmetry. The spectroscopic data were taken from the literature but in most cases supplemented by unpublished measurements in absorption and in fluorescence. Spectroscopic data for each ion were analyzed independently, then the model parameters were intercompared and in many cases adjusted such that in the final fitting process the principal interactions showed uniform trends in parameter values with increasing atomic number. Consistent with analyses of the spectra of lanthanide ions in both $LaCl_3$ and LaF_3, abrupt changes in magnitude of certain crystal-field parameters were found near the center of the $5f^N$-series. This resulted in two groups of parameter values, but with consistent trends for both halves of the series, and generally very good agreement between observed and computed energies. A new energy level chart based on computed crystal-field level energies for each trivalent actinide ion has been prepared. In addition, the parameters of the atomic part of each $5f^N$ Hamiltonian were used to calculate the matrix elements of $U^{(\lambda)}$ for selected transitions. The values were tabulated to facilitate calculation of intensity-related parameters for $5f^N$-transitions using the Judd-Ofelt theory.

1.0 INTRODUCTION

This systematic analysis of trivalent actinide (An) ion spectra was motivated by, and is patterned after, a similar recently published investigation of lanthanide (Ln) ion spectra.[1] In the lanthanide work, it was concluded that the data could be satisfactorily interpreted by using an effective operator model which reproduces the complete structure of the crystal-field split f^N-configuration; however, there was clear evidence for a lack of sensitivity of some atomic

parameters to the observed levels near the half-filled shell. The extent of this lack of sensitivity had not previously been recognized. In addition, extensive experimental evidence for Ln^{3+}:LaF_3 and reexamination of published data for Ln^{3+}:$LaCl_3$ provided the basis for demonstrating that the customary theoretical treatment of crystal-field splitting in the f-elements resulted in a break in the regular trends for some of the model parameters at the center of the series. As a consequence of these and other unexpected findings, we have now reexamined previous interpretations of the spectra of trivalent actinide chlorides. Since the data are in part those for doped single crystals of $LaCl_3$, An^{3+}:$LaCl_3$, and in part for thin films of pure (neat) $AnCl_3$, our present systematic investigation includes comparisons between spectra in the two different crystal media. These comparisons of the doped crystal and neat compound data for An^{3+} are facilitated by the fact that $LaCl_3$ and $AnCl_3$ (An = U through Es) are all isostructural. In contrast, crystal structure changes are observed along the $LnCl_3$ series.

Building on the energy level structure analysis of trivalent actinide spectra, much can be learned from the analysis of transition intensities. In a few instances, quantitative intensity calculations have been performed and related to fluorescing properties, particularly for the aquo ions. Such calculations require sets of matrix elements of the tensor operator, $U^{(\lambda)}$, connecting the states of interest. Since the present structure analysis has yielded a systematic set of atomic parameters for the +3 actinides, from which values of these operators can be computed, we include in this report limited sets of squared matrix elements of $U^{(\lambda)}$ (λ = 2, 4, 6) for each of the $5f^N$-configurations considered.

2.0 EXPERIMENTAL

Most of the spectroscopic data referred to in this investigation have already been published. The spectra were measured in absorption and in some instances in fluorescence using instruments of varying resolution, nominally at ~4 K and frequently at 77 K and 298 K as well. The spectra of neat $AnCl_3$ were obtained in transmission through thin films. While their quality was not as high as that obtainable with doped single crystals of $LaCl_3$, and no polarization measurements could be made, it turns out that a great many crystal-field components were clearly resolved. Comparison of the crystal and neat compound spectra often proved advantageous in making assignments. All of the spectra of neat compounds were measured using a 0.75 m crystal-grating monochromator recording spectrophotometer. Since original spectra were on file, some reinterpretation was made based on recent crystal-field calculations. Most of the crystal spectra and all of the spectra of neat compounds were published before crystal-field analyses were common. As a result of the present calculations, some transitions earlier classified as potentially electronic in origin are now identified

as vibronic. Spectroscopic measurements on Pu^{3+}:$LaCl_3$, not previously reported, were made using the recording spectrophotometer.

All of the neat compounds $AnCl_3$ (An = U through Es) crystallize in the hexagonal UCl_3-type structure as does $LaCl_3$.[2,3] Each metal ion is 9-fold coordinate in a site of C_{3h} symmetry. As was the case in analyzing the spectra of lanthanides in $LaCl_3$, we assume approximate D_{3h} symmetry.[4] In the doped crystal, polarized spectra can be obtained to provide an additional basis for assignment of transitions. Although polarization cannot be observed in the neat spectra, selection rules do limit the allowed transitions depending upon the crystal quantum numbers of the initial and final states. Where they were applicable, the selection rules on crystal-field transitions were found to be rigorously followed. The selection rules for D_{3h}-site symmetry for both (forced) electric dipole and magnetic dipole transitions are given in Table 1.[4]

3.0 HAMILTONIAN STRUCTURE

In recent years we have had considerable success in analyzing trivalent lanthanide and actinide spectra using an effective-operator Hamiltonian,[1,5,6,7] which will frequently be referred to as the "model". Since in addition to the indicated references, there has been a detailed review,[8] present treatment can be brief and involves primarily a description of the terms.

For both trivalent lanthanide and actinide ion spectra, it is useful to emphasize that the Hamiltonian is a sum of atomic (or free-ion), H_F, and crystal-field, H_{CF}, interactions:

$$H = H_F + H_{CF}$$

We assume a single configuration model, and correct the atomic part of the model for effects that result from the interaction of the f^N-configuration with all other configurations by including terms that treat such interactions as effective interactions within the f^N-configuration.

$$H = \sum_{k=o}^{6} F^k(nf,nf)\, f_K + \zeta_{nf} \sum_{\text{electrons}} (s \cdot \ell) + H_{Cl}(2) + H_{Cl}(3)$$

$$+ H_P + H_M + \sum_{k,q,i} B_q^k\, (C_q^k)_i \quad (k \text{ even}) \quad . \qquad (1)$$

Table 1.
Selection Rules for Crystal-field Transitions in C_{3h} (D_{3h}) Site Symmetry with Polarization Indicated

Electric Dipole Transitions for f^N-Configurations

N Even					N Odd			
μ/μ'	0	1	2	3	μ/μ'	1/2	3/2	5/2
0			σ	π	1/2		σ	σπ
1		σ	π	σ	3/2	σ	π	σ
2	σ	π	σ		5/2	σπ	σ	
3	π	σ						

Magnetic Dipole Transitions for f^N-Configurations

N Even					N Odd			
μ/μ'	0	1	2	3	μ/μ'	1/2	3/2	5/2
0	σ	π			1/2	σπ	π	
1	π	σ	π		3/2	π	σ	π
2		π	σ	π	5/2		π	σπ
3			π	σ				

The F^k and ζ_{nf} represent the electrostatic and spin-orbit integrals, their coefficients being the angular parts of those respective interactions. $H_{CI}(2)$ and $H_{CI}(3)$ represent two and three body interactions introduced to account for the effects of configuration interaction. The two-body operators are parameterized by α, β, and γ, while the three body parameters are t^k (k = 2,3,4,6,7,8). H_P and H_M represent second order magnetically correlated correction terms parameterized by P^k (k = 2,4,6) and M^k (k = 0,2,4), respectively. In the context of this model, the F^k are not equivalent to the integrals of the ab initio Hartree-Fock model.[8] Here the F^k are parameters, and as such they absorb some of the effects of configuration interaction.

Spectroscopic measurements interpreted in terms of energy levels form the data base which determines the values of the various parameters via a least squares fitting code. However, in practice, not all of the parameters of the model need to be varied simultaneously during the fitting procedure. In some cases, for groups of related parameters such as the P^k, only the leading parameter is varied and the others are required to maintain specified ratios to the leading parameter. This technique, on occasion, can also to be used to restrict the variation of F^k to that of a single parameter, F^2. For interactions such as the M^k, values computed using ab initio methods are found to be nearly identical to those obtained in the few cases where sufficient data are available to justify variation of the parameters. Thus the ab initio results were adopted for the whole set of An^{3+}. Some parameters show little change over the series and others are similar in magnitude in both the 4f and 5f-series. Typical values of the parameters compared to those computed using ab initio codes[8] are shown in Table 2.

The last term in (1) represents the crystal-field interaction; the parameters, B_q^k, appropriate to the D_{3h}-symmetry of present interest are B_0^2, B_0^4, B_0^6, B_6^6. For the lanthanides, as an approximation, the crystal-field can be treated as a perturbation of the free-ion structure, although for complete calculations, atomic and crystal-field interactions are diagonalized simultaneously. For the actinides, experience has shown that the crystal-field parameters in the trichlorides are similarly not very sensitive to significant changes in the atomic parameters as more of the latter are freely varied with an increasing number of assignments that serve to define them. For configurations (f^5-f^9) where the Hamiltonian matrices including the crystal-field were greater than 200 by 200, a truncation method was used to select portions of the complete matrices. The eigenstates of the free-ion Hamiltonian provided the basis states for these truncations.[8]

Table 2. Elements of the Parametric Hamiltonian

		Pu^{3+} ($5f^5$) $LaCl_3$ (cm^{-1})[a]	Sm^{3+} ($4f^5$) $LaCl_3$ (cm^{-1})[a]	Ab Initio Calc. Ln^{3+} (cm^{-1})
H_E (Electrostatic Term)	F^2	48679	78125	110157
$\sum_{k=0}^{6} f_k F^k$ (k–even)	F^4	39333	56809	69143
	F^6	27647	40061	49758
H_{SO} (Spin–Orbit Interaction)	ζ_f	2242	1168	1243
$A_{SO}\zeta_f$				
$H_{CI(2)}$ (Two–body Configuration Interaction)	α	30.0	21.6	28
	β	–678	–724	–615
$\alpha L(L+1) + \beta G(G_2) + \gamma G(R_7)$	γ	1022	[1700]	1611
$H_{CI(3)}$ (Three Particle Configuration Interaction)	T^2	190	291	394
	T^3	54	13	–34
	T^4	[45]	34	89
$\sum_i t_i T^i$ (i = 2,3,4,6,7,8)	T^6	–368	–193	–214
	T^7	363	288	314
	T^8	322	330	274
Electrostatically Correlated Spin–Orbit Interaction				
(Two–Body Pseudo–Magnetic Operators: P^2, P^4, P^6)	P^2	949	341	128
Spin–Other–Orbit and Spin–Spin Effects: Marvin Integrals M^0, M^2, M^4	M^0	0.87	2.75	
Crystal Field Interaction Potential (D_{3h})	B_0^2	197	186	
$[B_0^2 C_0^{(2)} + B_0^4 C_0^{(4)} + B_0^6 C_0^{(6)} +$	B_0^4	–586	–270	
$B_6^6 (C_6^{(6)} + C_{-6}^{(6)})]$	B_0^6	–1723	–623	
	B_6^6	1011	470	

4.0 SUMMARY OF EXPERIMENTAL RESULTS AND THEIR INTERPRETATION

In the following summary, primary reference is made in each case to experimental data which have already been published. In the case of results originating from this laboratory, spectra have been reexamined for evidence of additional data which might be included. In some cases, particularly for $AnCl_3$ spectra, assignments made earlier have been revised in light of the present crystal-field calculations. Some measurements not previously cited have been integrated into the analysis for the first time.

4.1 U^{3+}:$LaCl_3$

An interpretation of the energy level structure of U^{3+} based on absorption and fluorescence spectra of U^{3+}:$LaCl_3$ has been published.[9] Comparison with the spectrum of UCl_3[10] indicates very similar results at 298K, but no low temperature spectra of the latter have been published. Based on a study of the spectrum of U^{3+}:$LaCl_3$ in the range centered near 2300 nm (4350 cm^{-1}) as a function of decreasing temperature, the structure of the corresponding absorption feature in UCl_3 suggests a similar ground state splitting in the two media.

The assignment of observed transitions in U^{3+}:$LaCl_3$ and the computed energy level structure are given in Appendix I. The energy level parameters on which the computed levels are based are given in Table 3. Several important features of the experimental results need to be emphasized. Most of the reported transitions were observed at high resolution and polarization measurements were made. Since the ground state has $\mu = 5/2$, transitions in absorption to higher-lying $\mu = 5/2$ states are forbidden. The unpolarized spectrum of the $^4I_{11/2}$ group near 4500 cm^{-1} taken with a small unaligned chip of U^{3+}:$LaCl_3$ at moderate resolution shows three bands that result from transitions that are allowed from the ground $\mu = 5/2$ to excited $\mu = 1/2$ and 3/2 states, Fig. 1. Reference to Appendix I confirms the absence of any absorption features corresponding to the energies of the symmetry-forbidden transitions. The operation of this selection rule provides an important restriction on the number of observed transitions originating in the ground state. Several $\mu = 5/2$ states in U^{3+}:$LaCl_3$ have been assigned energies based on transitions from other than the ground state via temperature dependent absorption or fluorescence spectra.

In addition to the assignments given in Ref 9, and consistent with the selection rules, we have added several assignments based on further studies of the spectra of U^{3+}:$LaCl_3$ measured at moderate resolution and ~4K. These additional assignments are included in Appendix I. We have

Table 3. Energy Level Parameters for $An^{3+}:LaCl_3$ (in cm^{-1})[a]

	U^{3+}	Np^{3+}	Pu^{3+}	Am^{3+}	Cm^{3+}	Bk^{3+}	Cf^{3+}	Es^{3+}	Fm^{3+}	Md^{3+}	No^{3+}
F^2	39611(222)	45382(80)	48679(89)	[51900]	[55055]	[57697]	[60464]	63174(142)	65850	68454	
F^4	32960(418)	37242(215)	[39333 R]	[41600]	43938(148)	[45969]	[48026]	[50034 R]	52044	54048	
F^6	23084(352)	25644(196)	27647(89)	[29400]	32876(154)	[32876]	[34592]	[36199 R]	37756	39283	
ζ	1626(3)	1937(2)	2242(2)	2564(3)	2889(4)	3210(4)	3572(2)	3944(3)	4326	4715	5114
α	29.26(.44)	31.78(.30)	30.00(.15)	26.71(.31)	29.42(.32)	29.56(.54)	27.36(.26)	30.21(1.1)	30	30	
β	−824.6(29)	−728.0(18)	−678.3(12)	−426.6(42)	−362.9(51)	−564.9(47)	−587.5(21)	−761.0(55)	−600	−600	
γ	1093(105)	840.2(61)	1022(31)	977.9(28)	[500]	839.8(28)	753.5(14)	488.2(39)	450	450	
T^2	306(64)	[200]	190(8)	150(20)	[275]	127(15)	105(11)	[110]	100	100	
T^3	42(14)	45(7)	54(10)	[45]	[45]	24(59)	48(11)	[45]	45		
T^4	88(20)	50(6)	[45]	[45]	[60]	70(54)	59(21)	[50]	50		
T^6	−242(40)	−361(18)	−368(19)	−487(31)	−289(22)	−388(44)	−529(31)	−256(43)	−300		
T^7	447(61)	427(23)	363(14)	489(28)	546(95)	525(29)	630(34)	648(66)	640		
T^8	[300]	340(17)	322(10)	228(32)	528(52)	378(34)	270(14)	408(44)	400		
M^0	[.672]	[.773]	[.877]	[.985]	[1.097]	[1.213]	[1.334]	[1.458]	1.587	1.720	
M^2	[.372]	[.428]	[.486]	[.546]	[.608]	[.672]	[.738]	[.807]	.878	.951	
M^4	[.258]	[.297]	[.388]	[.379]	[.423]	[.468]	[.514]	[.562]	.612	.662	
P^2 [b]	1216(77)	1009(30)	949(24)	613(42)	1054(36)	687(83)	820(42)	506(102)	600	600	
B_0^2	287(32)	164(26)	197(22)	242(34)	[280]	280(40)	306(29)	[306]	306	306	306
B_0^4	−662(93)	−559(44)	−586(38)	−582(80)	[−884]	−884(62)	−1062(56)	[−1062]	−1062	−1062	−1062
B_0^6	−1340(89)	−1673(49)	−1723(39)	−1887(83)	[−1293]	−1293(68)	−1441(48)	[−1441]	−1441	−1441	−1441
B_6^6	1070(63)	1033(34)	1011(34)	1122(49)	[990]	990(40)	941(36)	[941]	941	941	941
σ [c]	29	22	18	21	23	22	19	22			
n [c]	82	167	193	79	84	83	110	47			

[a] Values in parentheses are errors in the indicated parameters. Values in brackets were either not allowed to vary in the parameter fitting, or if followed by an R, were constrained: For Pu^{3+}, $F^4/F^2 = 0.808$; for Es^{3+}, $F^4/F^2 = 0.792$, $F^6/F^2 = 0.573$. All parameters for Fm^{3+}, Md^{3+}, and No^{3+} are extrapolated values.

[b] P^2 was varied freely, P^4 and P^6 were constrained by the ratios $P^4 = 0.5\,P^2$, $P^6 = 0.1\,P^2$.

[c] Deviation $(\sigma) = \sum[(\Delta i)^2/n-p]^{1/2}$, where Δi is the difference between observed and calculated energies, n is the number of levels fit, and p is the number of parameters freely varied.

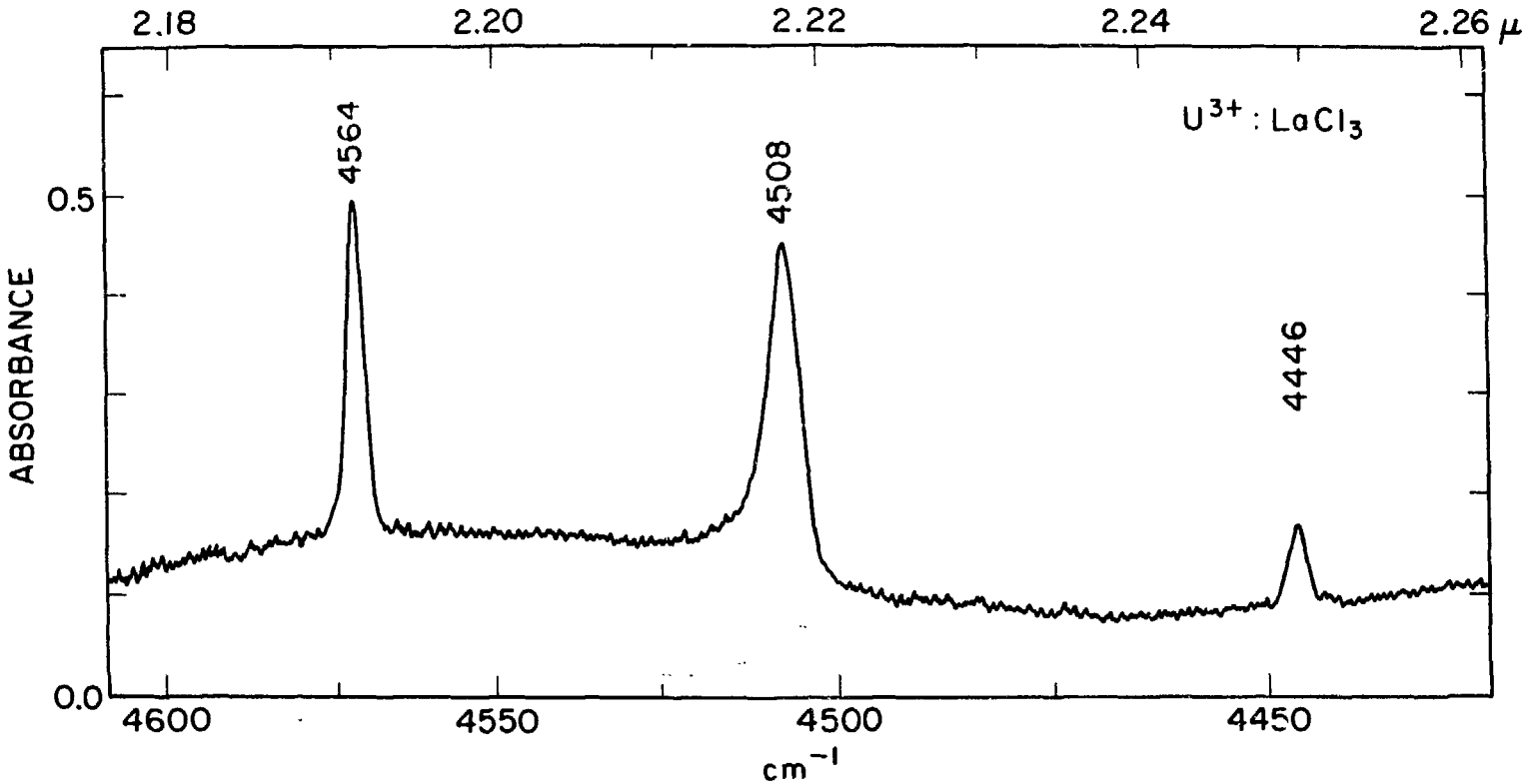

Fig. 1. The Y Group ($^4I_{11/2}$) in U^{3+}:$LaCl_3$ in Absorption (unpolarized) at 4 K.

also included several assignments to clearly observed absorption bands not made earlier because of apparent conflicts between the energy and/or polarization of the transition compared to that computed. Although some of these assignments result in larger than the average discrepancies between observed and computed levels they serve as a reminder of some of the difficulties that *tended to be unique to the analysis of the* U^{3+} *data.*

The observed line at 9762.94 cm^{-1} presents a special problem because it is prominent, yet its polarization ($\sigma\pi$) would require assignment as an electric dipole transition that would be completely inconsistent with the computed level scheme. We assume it is allowed as a magnetic dipole transition. We also observed an absorption at 77 K which could be interpreted as a temperature dependent transition from Z_3 ($\mu = 3/2$) to A_4 ($\mu = 5/2$).[9] This would be consistent with the computed energy of this state. A serious discrepancy was also pointed out earlier[9] with respect to assignment of the line at 11246.77 cm^{-1}, since the $\sigma\pi$-polarization reported would classify it as a $5/2 \rightarrow 1/2$ transition. We observe a very strong absorption band at 11246 cm^{-1}, and there is no alternative within the present crystal-field calculation to assigning this as a $\mu = 3/2$ state.

As a result of the additional assignments, the energy level parameters obtained in the data fitting process are not identical to those reported in the previously published work. The new fit included 84 levels compared to 51 assigned earlier, and in a few instances there is a change in the order in which the energy levels occur compared to the earlier tabulation.

4.2 $\underline{Np^{3+}}$:$\underline{LaCl_3}$/$\underline{NpCl_3}$

Extensive analyses of absorption spectra of both Np^{3+}:$LaCl_3$[11] and $NpCl_3$[12] have been published. Since the lowest-lying crystal-field component (ground state) has $\mu = 2$, there is a restriction on transitions observed in absorption, i.e. transitions to excited $\mu = 3$ states are forbidden by electric dipole selection rules, Table 1. This was not a consideration in the earlier work with $NpCl_3$, since only free-ion calculations were performed at that time. The present analysis of the Np^{3+}:$LaCl_3$ spectra follows that given earlier with only a few additional assignments, based on Zeeman data or observation of crystals with a higher concentration of Np^{3+}, Appendix II. All energy level parameters within their stated errors are the same as those published previously,[11] Table 3.

In comparing the energies of transitions observed in Np^{3+}:$LaCl_3$ with those of the apparently corresponding transitions in $NpCl_3$, Appendix II, it can be concluded that the structure of the crystal-field is essentially the same for both the neat and doped crystals, i.e. the same

crystal-field parameters characterize the two data sets. The atomic parameters are clearly different for the two sets with somewhat larger values characteristic of the doped Np^{3+}:$LaCl_3$ system. However, in the context of a number of parameters varying simultaneously, none showed disproportionate sensitivity to the change in medium. At lower energies where the most extensive comparisons can be made to observed levels in the same group in Np^{3+}:$LaCl_3$ and $NpCl_3$, the energy shift $\Delta E_N = E(Np^{3+}:LaCl_3)-E(NpCl_3)$, appears to be only 30-40 cm^{-1}. This was noted earlier[12] when centers of gravity of free-ion groups in Np^{3+}:$LaCl_3$, $NpCl_3$, Np^{3+}:$LaBr_3$ and $NpBr_3$ were compared. Shifts relative to Np^{3+}:$LaCl_3$ are significantly larger for both Np^{3+}:$LaBr_3$ and $NpBr_3$ than for $NpCl_3$.

Since estimated intensities of photographically recorded spectra (Np^{3+}:$LaCl_3$) were reported, comparison can be made with the $NpCl_3$ absorption spectra. In a number of groups where some intensity variation is indicated in Np^{3+}:$LaCl_3$ spectra, it is similarly reflected in the absorption band intensities. In a few cases where particularly broad bands are observed in $NpCl_3$, i.e. 10831 cm^{-1}, there is no apparent correlation with the Np^{3+}:$LaCl_3$ spectra. In assigning transitions to the $NpCl_3$ bands, both intensity and energy difference were used as criteria since within a single J-state, energy differences to paired states (crystal and neat sample) remained nearly the same. Some of the weaker band structure in $NpCl_3$ was assumed to be vibronic in origin. There was no apparent correlation between observations in $LaCl_3$ and the neat sample near 16000 cm^{-1}. The energy shifts, ΔE_N, increased with increasing transition energy reaching the range of 60-70 cm^{-1} near 20000 cm^{-1}. This range was infrequently exceeded up to the limits of observation, ~26000 cm^{-1}.

4.3 $\underline{Pu^{3+}:LaCl_3/PuCl_3}$

The spectrum of Pu^{3+}:$LaCl_3$ was observed at high resolution, with both polarization and Zeeman measurements reported for a number states.[13,14] A subsequent analysis of the spectrum of $PuCl_3$ made possible additional assignments,[15] but the theoretical interpretation was limited to free-ion calculations as was that for Pu^{3+}:$LaCl_3$. While approximate crystal-field parameters have been cited in the literature,[6,7] no complete analysis has been published. In the course of the present reevaluation of existing data, previously unreported measurements at moderate resolution with a crystal of Pu^{3+}:$LaCl_3$ were integrated into the analysis. Spectra of the latter crystal recorded at ~4 K frequently showed a 13 cm^{-1} satellite to the electronic transitions. These satellites could be identified as transitions originating in the first excited crystal-field level of the ground state. Since the ground state has a crystal quantum number $\mu = 1/2$, electric dipole transitions in absorption to excited $\mu = 1/2$ states are forbidden, and indeed were characteristically absent in both the crystal and neat compound spectra. Existence of transitions originating in the 13

cm^{-1} level in the new measurements was therefore highly advantageous; with $\mu = 3/2$, transitions are symmetry allowed to all excited crystal-field states, Table 1. This permitted verification of numerous assignments as well as actual assignment of several $\mu = 1/2$ states. A listing of observed energies compared to those computed based on a complete crystal-field analysis is given in Appendix III.

The energies of transitions observed in $Pu^{3+}:LaCl_3$ and the apparent analog transitions in $PuCl_3$ are also compared in Appendix III. Particularly in the lower energy range, the differences in energy $\Delta E_N = E(An^{3+}:LaCl_3) - E(AnCl_3)$, are qualitatively smaller for An = Pu than for Np.

The only clear discrepancy between the literature data for $Pu^{3+}:LaCl_3$ [14] and the present analysis is the reported intense π-polarized line at 22070.8 cm^{-1} which implies a $\mu = 3/2$ state at 22083 cm^{-1}. Comparison with the new measurements of $Pu^{3+}:LaCl_3$; which reveal a strong sharp band at 22079 cm^{-1} and a weaker and somewhat broader band centered at 22040 cm^{-1}, as well as with the spectrum of $PuCl_3$, strongly suggest that the band in question must be the expected $\sigma\pi$-polarized transition to a $\mu = 5/2$ state in agreement with the model calculation.

A level at 18245 cm^{-1} was identified as a moderately intense $\mu = 1/2$ state in Ref. 13, while in the present investigation a single moderately intense band at 18236 cm^{-1} could be assigned as a transition from the excited 13 cm^{-1} level in the ground state and thus as a $\mu = 1/2$ state at 18249 cm^{-1}, consistent with the earlier work. However the model places the nearest $\mu = 1/2$ state near 18294 cm^{-1}. This discrepancy remains unresolved.

The wealth of experimental data available for $Pu^{3+}:LaCl_3$, including the extensive correlation with the spectrum of $PuCl_3$, would appear to make this a good case for fitting a large number of the parameters of the model. However the $5f^5$ configuration extends to ~90000 cm^{-1} while present measurements only reach to ca. 32000 cm^{-1}. Thus in the final parameter fitting it is not unexpected to find some lack of sensitivity in some parameters. As indicated in Table 3, F^4 was finally varied in ratio to preserve apparent systematic correlations across the series.

In comparing paired transitions in $Pu^{3+}:LaCl_3$ and $PuCl_3$, sufficient data exist to indicate a parallelism in transition intensities in the two media, and based on the similarity in energy level shifts, ΔE_N, for each component of a given J-state, it is apparent that the same crystal-field parameters can be used to describe the crystal-field splittings in the two. If we reexamine the earlier assignments of centers of gravity to the spectrum of $PuCl_3$, [15] it is obvious that many of those assignments were influenced by what would now be characterized as vibronic structure.

Thus we would not expect to find a good correlation between previously deduced free-ion parameters and those that would describe the states as presently characterized.

4.4 Am^{3+}:$LaCl_3$/$AmCl_3$

As in the cases of Np^{3+} and Pu^{3+}, there are considerable spectroscopic data available in the literature for both the neat ($AmCl_3$) sample and the doped $LaCl_3$ single crystal. However, no previous detailed theoretical analysis of the crystal-field structure has been made. All of the published analyses deal only with the free-ion structure; the crystal-field parameters previously quoted[6,7] were interpolated based on fitted parameters for the Pu^{3+}:$LaCl_3$ and Cm^{3+}:$LaCl_3$ systems.

Very sharp band spectra are characteristic of Am^{3+} ($4f^6$). The J=0 (μ=0) ground state is separated from the first excited state by ~2750 cm^{-1}, so there are no temperature dependent electric or magnetic dipole transitions from thermally populated excited states. There is extensive vibronic structure which is more apparent in the $AmCl_3$ spectra and therefore the electronic transitions do sharpen and become more intense when the samples are cooled to 77 K or lower.

As a consequence of a spin-orbit interaction parameter that is practically twice as large for Am^{3+}:$LaCl_3$ as for Eu^{3+}:$LaCl_3$[5,6], a much larger splitting of the ground term (^7F) multiplet is found in Am^{3+}, Fig. 2. This makes possible an extensive comparison of the absorption spectra of components of the ground multiplet with theory, particularly when coupled with much greater average transition intensity in Am^{3+}. Thus some of the unique characteristics of f^6-configuration spectra are most apparent in the study of Am^{3+}.

Several discrepancies found in the measurement and interpretation of the early spectroscopic results for Am^{3+}:$LaCl_3$[16,17] were subsequently corrected and the data base extended by fluorescence studies.[18] The extensive (lower resolution) spectroscopic investigation of the $AmCl_3$ system was published later.[19] However it was the recent investigation of the Ln^{3+}:LaF_3 system[1] that highlighted the need for the present reevaluation of the data for Am^{3+}. There is a break at Gd^{3+} ($4f^7$) in the smooth variation of crystal-field parameters over the series, both for Ln^{3+}:LaF_3 and Ln^{3+}:$LaCl_3$, but Eu^{3+} ($4f^6$) was found to be a typical member of the lighter half of the series with crystal-field parameters similar to those for $4f^5$ (Sm^{3+}). This suggested that it might have been a mistake to have interpolated parameters for Am^{3+} between those for Pu^{3+} and Cm^{3+}; the crystal-field parameters for Pu^{3+} would be expected to provide a better approximation of the splitting in Am^{3+}.

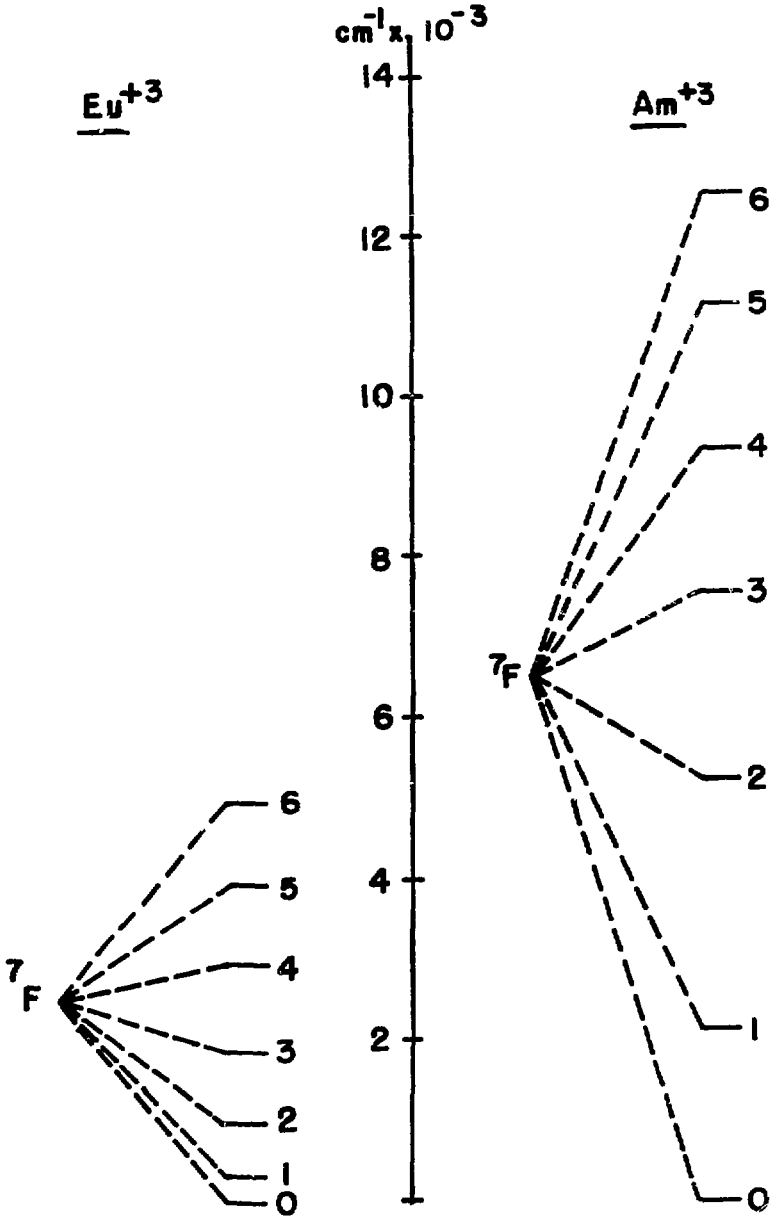

Fig. 2. Comparison of the Centers of Gravity of the Levels Comprising the Ground Term Multiplets for Eu^{3+} ($4f^6$) and Am^{3+} ($5f^6$).

The spectroscopic results for Am^{3+}:$LaCl_3$ in absorption were supplemented by fluorescence data[18] which provided the basis for assignment of a number of levels which could not be reached from the ground J=0 (μ=0) state in absorption because of selection rules. This limitation of allowed electric-dipole transitions in absorption to excited states with μ=2 or 3, Table 1, in fact leads to the expectation of relatively sparse absorption spectra in both the neat and doped crystal cases.

For Am^{3+}:$LaCl_3$ the results in Table I of Reference 17, as well as the experimental results at lower energy were well reproduced by the initial computed energy level structure in the present reanalysis. The components of the $^7F_5$ group near 11200 cm^{-1} were not reported in the $LaCl_3$ matrix, so in this case certain crystal-field component energies were defined by observations in $AmCl_3$.

Failure to observe the $^7F_0 \rightarrow {}^5D_1$ transition in Am^{3+}:$LaCl_3$ was explained by Conway and Judd[20] as an accidental suppression of the normally expected magnetic dipole strength. They and we attributed similar energies to this transition. We located the level near 17000 cm^{-1} in dilute acid solution, and ascribed the intensity to an electric dipole mechanism.[21] The collected experimental results for both Am^{3+}:$LaCl_3$ and $AmCl_3$ are given in Appendix IV.

The comparison of spectra of Am^{3+}:$LaCl_3$ and $AmCl_3$ was particularly useful in the present analysis. While there are a number of isolated groups of low J-value, observation of the spectra in $AmCl_3$ in the energy region of the more extensive groups, and particularly the relative energies of the more intense transitions within those groups was a useful guide in making assignments for Am^{3+}:$LaCl_3$. Where several bands in $AmCl_3$ in a limited energy range could be correlated by energy with lines in the Am^{3+}:$LaCl_3$ spectrum, the relative intensities were also comparable. Several of the more intense bands observed at higher energies in $AmCl_3$, but not reported in Am^{3+}:$LaCl_3$, were included in the fit after correction for the energy differences in the two different matrices.

The large number of different excited J-states to which transitions could be assigned provided an initial basis for fitting the free-ion parameters. By selective variation of individual F^k parameters, it was possible to establish their approximate magnitudes. These approximate values turned out to be consistent with values projected from apparent trends along the series. In the final analysis, both a good fit to the experimental data and insistence on a regular progression in the F^k parameters as a function of Z could be accommodated by adopting a single set of values for the F^k and holding them constant. This made it possible to freely vary the two and most of the three-body

parameters. The F^k parameters for Am^{3+} ($5f^6$) were found to be even less sensitive to determination via a standard data fitting program than were the corresponding parameters for Eu^{3+}:LaF_3,[1] although the situation is analogous. In contrast the crystal-field parameter values were well established in fits to just the lower-lying levels, and did not significantly change as additional higher energy levels were added to the set. There were a number of transitions to $\mu = 0$, 1 states identified experimentally in the lower energy range by fluorescence spectra. These uniquely determine the value of B^2_0, , providing a basis for the determination of the remaining crystal-field parameters via the numerous allowed transitions to levels characterized by $\mu = 2, 3$. The final parameter set, used to compute the levels shown in Appendix IV, is given in Table 3. The values of F^k for Am^{3+} given in Table 3 are actually quite similar to those published earlier in the approximate free-ion analysis of the data for $AmCl_3$,[19] except for F^4.

Since many of the absorption bands in $AmCl_3$ were sharp and relatively isolated in energy as well as being clearly identified with polarized line spectra in Am^{3+}:$LaCl_3$, the shift in energy between corresponding transitions in the two media was established in numerous groups. There appear to be two characteristic energy ranges for ΔE_N. In the ground term multiplet (0 to ~13000 cm^{-1}), shifts averaged ~10 cm^{-1}, whereas at higher energies (to ~35000 cm^{-1}) shifts averaged 40-50 cm^{-1}.

4.5 Cm3+:$LaCl_3$

There is only one report in the literature of the crystal-field splitting observed in the spectrum of Cm^{3+}:$LaCl_3$.[22] Interpretation at the time was limited to the free-ion structure, but subsequently the results of a crystal-field analysis were cited.[6,7] A comparison of the observed and computed crystal-field levels has not been published.

Previous free-ion and crystal-field interpretation of the experimental data for Cm^{3+}:$LaCl_3$ was critically reexamined in view of the results obtained in the recent systematic interpretation of lanthanide ion spectra.[1] It was found that for Gd^{3+}:LaF_3, the F^k were in fact poorly determined. Only a small fraction of the states in the $4f^7$-configuration occur within the optical range, < 50000 cm^{-1}. However, a good fit to experimental data could be achieved by requiring values consistent with what appeared to be systematic trends in parameter values over the series. It was also established that more than one set of crystal-field parameters with quite different values, either those for Eu^{3+}:LaF_3 or Tb^{3+}:LaF_3, satisfactorily fit the available data. While the ground state crystal-field splitting in Gd^{3+}:$LaCl_3$ was too small to be resolved, and thus the ordering by crystal-

field quantum number could not be determined from spectroscopic data, it was pointed out that a positive sign for the B_0^2, term was not consistent with certain magnetic data.[23]

In exploring the correlation between observed and calculated crystal-field level energies for a number of different trial sets of free-ion and crystal-field parameters, it was concluded that several transitions were inconsistent with any series consistent parameterization. The level at 33852 cm^{-1} was not encompassed in either the present or earlier[22] free-ion structures. The group of six reported transitions in the range 31988-32137 cm^{-1} (Group P)[22] is now attributed to a J = 9/2 state requiring the exclusion of one of the observed levels as an electric dipole transition. We chose to exclude the weak level reported at 32126 cm^{-1}. Two other very weakly observed transitions at 16931 and 21903 cm^{-1} were also deemed inconsistent with the calculations. All other reported crystal-field levels were included in the fitting procedure with results shown in Appendix V.

As in the case of Am^{3+}:$LaCl_3$, the F^k parameters in Cm^{3+}:$LaCl_3$ assumed values inconsistent with series trends when all were varied freely. In particular, the fit value of F^6 which gave the best reproduction of the experimental free-ion structure was significantly larger than the value consistent with systematic trends. When values of F^k predicted from systematic trends were adopted and not allowed to vary, no change in the two and three-body operators could compensate for what was primarily a distortion introduced by the assumed value of F^6. The fitting constraints finally adopted required a value of F^2 consistent with series trends, but F^4 and F^6 were free to vary. It was necessary to restrict the variation of both γ and T^2, but good correlation with experiment could be achieved, Appendix V.

The behavior of the crystal-field parameters for Cm^{3+}:$LaCl_3$ was reminiscent of that in Gd^{3+}:LaF_3,[1] where either the parameters determined for Eu^{3+}:$LaCl_3$ or those determined for Tb^{3+}:$LaCl_3$, although different since they reflected the abrupt change in the magnitude of certain parameters at $4f^7$, gave a fit of the available experimental data for Gd^{3+}:LaF_3 within the same low limits of error. A similar approach to fitting the data for Cm^{3+}:$LaCl_3$ showed that the crystal-field parameters determined for Bk^{3+}:$LaCl_3$ gave a somewhat better fit (lower error) to the observed levels of Cm^{3+}:$LaCl_3$, than did the set for Am^{3+}:$LaCl_3$. When allowed to vary freely, the crystal-field parameters for Cm^{3+}:$LaCl_3$ took on values somewhat intermediate between those for Am^{3+} and Bk^{3+}. However the fit did not result in a lower error than that obtained with the set derived for Bk^{3+}:$LaCl_3$. The energy level parameters finally used to compute the level scheme for Cm^{3+}:$LaCl_3$, and shown in Table 3, included the crystal-field parameter set for Bk^{3+}:$LaCl_3$. Experimental investigation of the spectrum of neat $CmCl_3$ has not been reported.

Both EPR data for Cm^{3+}:$LaCl_3$,[24] and the fluorescence results[22] were interpreted as identifying a ground state with $\mu = 1/2$. This is predictably inconsistent with the present computed ordering of the ground state levels, Appendix V. As Wybourne[23] pointed out for Gd^{3+}:$LaCl_3$, for a fourth-order mechanism, which is probably the simplest source of off-diagonal matrix elements for the crystal-field in this special case of the f^7-configuration, a positive value for B_0^2, which is confirmed for both Ln^{3+}:$LaCl_3$ and An^{3+}:$LaCl_3$, will place the $\mu = 7/2$ state lowest. Although only two of the three excited components of the ground state were identified in the original work,[22] it appears reasonable to assume that the total splitting is $< 8\ cm^{-1}$. We assign the ground state as $\mu = 7/2$, and consider the discrepancy to represent an unresolved problem.

4.6 $\underline{BkCl_3/Bk^{3+}:LaCl_3}$

Spectroscopic data for Bk^{3+} in C_{3h}-symmetry have been obtained primarily from absorption spectra of thin films of $BkCl_3$,[25] supplemented by observation of fluorescence from several states in dilutely doped Bk^{3+}:$LaCl_3$.[26,27] At an early point in the analysis it appeared reasonable to assume, based on the character of the observed spectrum, that like its lanthanide analog, Tb^{3+}, the ground crystal-field component had $\mu = 0$. As it turns out, there are a number of well characterized excited states that are isolated in energy coupled with a frequent pairing within a narrow energy range of states with $\mu = 2$ and 3. Transitions from ground to excited $\mu = 0$ and 1 states are forbidden. These factors, together with approximate energy level parameters extrapolated from lighter members of the series were of considerable assistance in completing a new comprehensive analysis of the energy level structure. Assignment of transitions observed both in absorption and fluorescence is given in Appendix VI. Although only a small number of fluorescing transitions were measured, all were consistent with the energy level scheme based on transitions observed in absorption. In a few instances the same transition was identified in absorption and fluorescence. No significant energy differences were found between the same transition observed in neat and doped crystal samples. The parameters obtained in fitting the experimental data are shown in Table 3. The crystal-field parameters are, within stated errors, the same as those reported earlier.[7]

In refining the fit to the data a number of different conditions were imposed including varying F^2 while requiring the ratios F^4/F^2 and F^6/F^2 to remain fixed. During this process it became

evident that the F^k parameters were in every case poorly determined. Rapid convergence of other parameters of the model, particularly the crystal-field parameters, was obtained at the outset and subsequent changes in the F^k resulted in only marginal changes in most other parameters. In the final fitting of the data, the F^k parameters were fixed at values consistent with series trends, and most of the two and three-body operators allowed to freely vary. It is possible that some improvement of the fit could be obtained with slightly different values of F^k without changing the general conclusions drawn.

As was the case with Tb^{3+}:LaF_3,[1] we observe only a small fraction of the states in the f^8-configuration, so the analysis of the free-ion interactions can at best be approximate. Of direct interest is the contrast in the values of the crystal-field parameters for Bk^{3+} with those of Am^{3+}. There is a break in the regular progression, particularly in the values of B_0^4 and B_0^6 . The break indicated for B_6^6 can be attributed to a larger than average (for the series) value for Am^{3+} with a more series consistent value for Bk^{3+}. The value of B_0^2 is, within the stated error, similar for the two ions. This corresponds in general to the results obtained with Ln^{3+}:LaF_3,[1] except that there, the break at f^7 was most clearly apparent in B_6^6, .

As shown in Appendix VI, the computed structure of the ground state $^7F_6$ places two $\mu = 0$ components lowest in energy with a gap of 146 cm^{-1} to the next (μ=1) state. This structure would insure that observations at 4 K would be limited to transitions originating in a μ=0 state and terminating in excited μ = 2, 3 states, Table 1. It was noted earlier that a number of excited states are isolated in energy and also have μ = 2 and 3 components at nearly the same energy. In such cases, where a single absorption band was observed, both states were assigned the same energy. While the basic structure of the crystal-field was established in assignments to lower energy states, these additional assignments at higher energy, consistent with the computed crystal-field structure, were of value in defining the atomic parameters.

4.7 $CfCl_3$/Cf^{3+}:$LaCl_3$

Spectroscopic measurements in transmission through thin films of $CfCl_3$ revealed an extensive narrow band structure characteristic of f→f transitions which extended to >30000 cm^{-1} before being lost in much more intense broad bands.[28] These measurements in absorption can now be closely correlated with subsequent measurements of the fluorescence spectrum of Cf^{3+}:$LaCl_3$ which, in particular, defined most of the crystal-field structure in the ground state.[26,27] Since the ground state has μ = 3/2, transitions from it to any higher energy crystal-field state are symmetry allowed. Transition energies defined in the neat sample and doped crystal

host showed no significant energy difference. As was the case for $BkCl_3$, a number of isolated groups of levels representing single free-ion states were found, and this together with the present approach to the free-ion analysis, resulted in some changes compared to our earlier crystal-field analysis.[7] In a number of cases, mainly at higher energies, more than one transition was computed to have nearly the same energy as an observed single absorption band. In initial fits to experiment, only one level was assigned, but when successive fits showed the same grouping of computed energies, identical assignments were finally made to each member of the group. Earlier attempts to develop a complete fit to the data had allowed free variation of parameters without regard for systematics. This led to several assignments that were inconsistent with the present treatment of the data. In part the present changes in the analysis are the result of recognition that only a small fraction of the total number of states in the configuration were observed experimentally, and thus that additional guidelines are needed, particularly in defining the F^k.

The experimental results and the computed energy level structure are given in Appendix VII; the energy level parameters used in the calculations are found in Table 3.

4.8 Es^{3+}:$LaCl_3$

The only available high resolution spectroscopic data for Es^{3+} taken at low temperature were obtained in studies of the fluorescence spectrum of Es^{3+}:$LaCl_3$.[26,27] Although we have no direct comparison with the absorption band structure of neat $EsCl_3$, it was found that the observed crystal-field structure in Es^{3+}:$LaCl_3$ was so well reproduced by using the crystal-field parameter values defined for $CfCl_3$/Cf^{3+}:$LaCl_3$ as a model, that no separate crystal-field parameter variation was required. This is not unexpected, since it follows closely trends observed in the heavier members of the lanthanide series for Ln^{3+}:LaF_3, where as a good approximation crystal-field parameters for one ion could be taken directly for those of a neighbor. The free-ion structure deduced in the analysis of the crystal spectra was generally consistent with that previously estimated based on the absorption spectrum of Es^{3+} (aquo).[29] A somewhat larger data set was used compared to that upon which earlier parameters were based.[7] Some new assignments were made in the course of the present reexamination of existing spectroscopic measurements. Comparison of experiment with the computed energy level structure is shown in Appendix VIII. The corresponding energy level parameters are given in Table 3.

4.9 Fm^{3+}:$LaCl_3$, Md^{3+}:$LaCl_3$, No^{3+}:$LaCl_3$

The heaviest members of the trivalent actinide series that will exhibit characteristic f-electron spectra in the optical energy range, $Fm^{3+}(5f^{11})$, $Md^{3+}(5f^{12})$, and $No^{3+}(5f^{13})$, have yet to be examined experimentally. Although the amounts of these elements that can presently be made available are at the pico or sub picogram level, selective excitation with a laser source coupled with photon counting detection techniques should make possible limited experimental investigations. As a step in this direction, best estimates of the energy level structure can be useful. Thus, in Appendices IX, X, and XI, energy levels are given based on an extrapolation of energy level parameters for those ions studied experimentally. The parameter values used in the computations are included in Table 3. In each instance, the crystal-field parameters assumed are those for Cf^{3+}:$LaCl_3$ since too little data is available from which to project series trends. In any case, one would predict little change in this range consistent with the results obtained in the Ln^{3+}:LaF_3 and Ln^{3+}:$LaCl_3$ systems.[1] Trends in the F^k parameters as extrapolated are indicated in Fig. 3. The parameters of the two and three-body operators are assumed to be similar to those of Es^{3+}:$LaCl_3$.

5.0 SYSTEMATIC TRENDS

In this section we examine the trends over the actinide series in energy level parameter values initially determined independently for most of the ions. Intercomparison of values resulted in changes in the number of parameters freely varied finally yielding more series consistent sets. In view of the lack of sensitivity of some of the parameters to the available sets of data, this must be regarded as one method by which consistently good correlations between (available) experiment and theory can be obtained. There is no basis for assuming that the present approach produces uniquely the best correlations. The determination of atomic and crystal-field parameters is considered in separate sections.

5.1 Atomic (free-ion) Parameters

It was apparent from our earlier analysis of the spectrum of U^{3+}:$LaCl_3$,[9] that U^{3+} constituted a special case with respect to any systematic variation in atomic parameter magnitude over the An^{3+} series. This conclusion was confirmed in the present reexamination of the data. While some of the discrepancies in the U^{3+} analysis encountered earlier have been resolved, and additional levels have been assigned such that the analysis is now based on states that span an energy range that includes over 78% of the states in the entire $5f^3$-configuration, it is clear that the energy level parameters for U^{3+}:$LaCl_3$ are generally atypical of the series. Systematic trends in

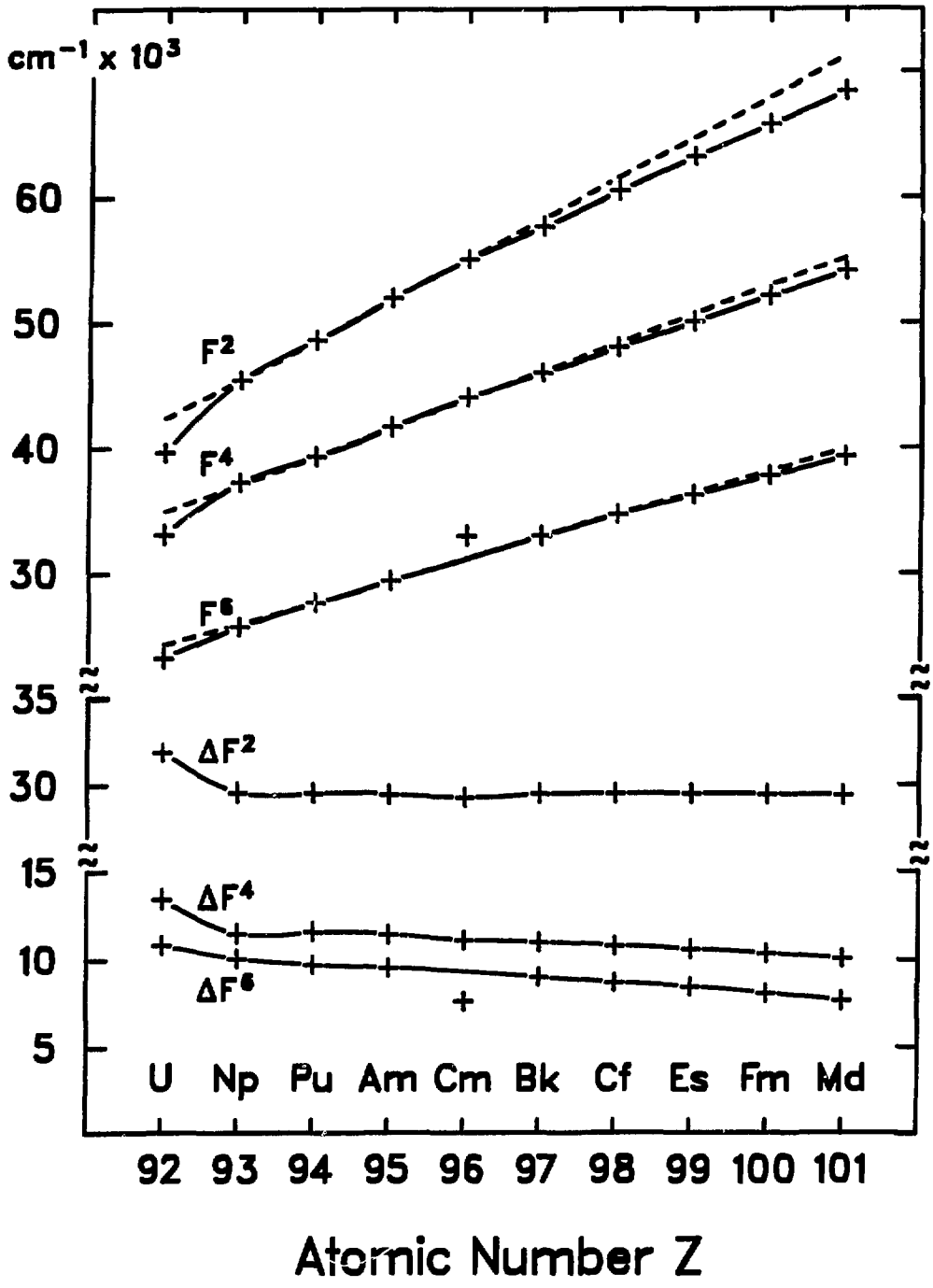

Fig. 3. Variation of the Parameters F^2, F^4, F^6, ΔF^2, ΔF^4, and ΔF^6 where $\Delta F^N = F^N$ (HFR)-F^N (EXPT) in cm^{-1} for An^{3+}:$LaCl_3$ as a Function of Atomic Number.

the F^k energy level parameters derived from fitting experimental data for the trivalent actinide chlorides appear to begin with Np^{3+}, not U^{3+}, Fig. 3.

In developing the analysis for the Ln^{3+}:LaF_3, we had extensive experimental data for most of the members, particularly those near the beginning and those near the end of the series. Comparison of free-ion parameters derived from individual analyses then revealed the few exceptions to what were otherwise readily apparent trends in parameter values. The experimental basis is much less extensive in the An^{3+}:$LaCl_3$/$AnCl_3$ series, and apparent trends in parameter values begin at Np^{3+} which is already a rather complex ($5f^4$-configuration) spectrum for analysis. The experimental data only span an energy range of ~30% of that of the $5f^4$ and a similar fraction of the $5f^5$-configuration. With $Am^{3+}(5f^6)$, $Cm^{3+}(5f^7)$ and $Bk^{3+}(5f^8)$, the experimentally observed states span even a smaller fraction of the total energies of the configurations, Fig. 4. This problem was also faced in the analogous lanthanide f^6 to f^8-configurations, but apparent systematic trends in parameter values were sufficiently established from analyses at the beginning and end of the series to provide a useful basis for interpolation over the whole series. Guidelines for systematic trends are much less obvious in the actinide series. The energy level structures of several members at the heavy end of the series have not yet been studied experimentally by spectroscopic techniques. Indeed, it is the prediction of energies at which structure should be found, Appendices IX-XI, that will be useful in designing future experiments.

Early efforts showed that a linear extrapolation of F^k as a function of Z was not consistent with the experimental data that were available for the heavier actinides, although it did appear to give consistent results for lighter members of the series. Analogous behavior was encountered in the analysis of Ln^{3+}:LaF_3. The trends in experimental F^k values are similar to those computed using Hartree-Fock methods (HFR code);[8] the proportional increase in F^k with Z is less for the heavier than for the lighter actinides as indicated by comparison with the dashed lines (linear extrapolation) in Fig. 3.

We found an even greater lack of sensitivity of the F^k-parameters to the available data for the $5f^6$, f^7, and f^8-configurations than was found for the 4f-analogues although the mixing of states in each free-ion eigenvector is much greater for the actinides. It had been anticipated that this would aid the analysis. Throughout the process of examining fits to the data based on different sets of F^k, we found that the corresponding changes in the crystal-field parameters were very small. Thus, as in the lanthanides, the crystal-field appears to be moderately decoupled from the atomic part of the interaction.

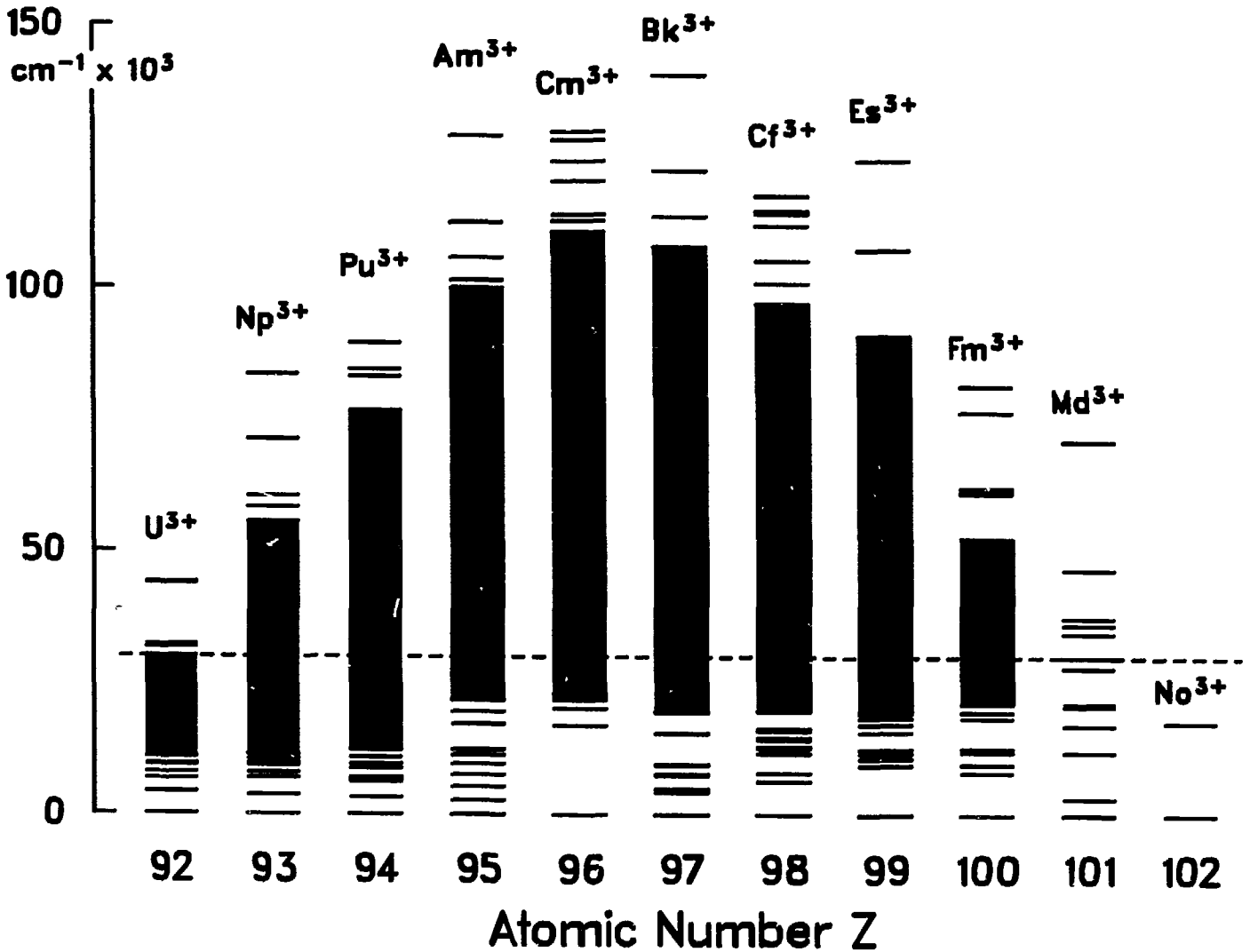

Fig. 4. Approximate Extent of the $5f^N$-Configurations Computed for $An^{3+}:LaCl_3$.

Since the values of F^k obtained from fitting experimental data appeared generally to follow trends computed using Hartree-Fock methods, we had earlier adopted the practice of extrapolating from trends in the differences, F^k (HFR)-F^k (EXPT) = ΔF^k because of the linearity of the plot of ΔF^k vs. Z.[7] Plots of current values for the An^{3+}:$LaCl_3$/$AnCl_3$ system are illustrated in Fig. 3. Some values in Table 3 are significantly changed from those reported earlier[7] as a result both of reevaluation and new data; consequently, the trends in Figure 3 are not all consistent with previous expectations of little or no slope in all three functions of ΔF^k vs. Z.[7,8] Based on the trends in F^k that were adopted, the ratios F^4/F^2 and F^6/F^2 both decrease with increasing Z for An^{3+}, whereas for Ln^{3+}:LaF_3, F^4/F^2 decreased and F^6/F^2 increased.

In contrast to the F^k parameters, values of the spin-orbit integrals appear to be well established based on the experimental data available in each case studied, and the values given in Table 3 are similar to those cited in previous tabulations.[7] The series trend in this parameter as a function of Z is similar to that found for Ln^{3+} in Ln^{3+}:LaF_3 where the data could be represented by a cubic equation.[1] The trend in the fit parameters also closely parallels that of ζ(HFR), Figure 5. The plot of $\Delta\zeta = \zeta$(HFR)-ζ(EXPT) vs. Z shows a scatter of points similar to that found for the corresponding function of Ln^{3+}:LaF_3 with the difference that the mismatch results in a curve with a shallow minimum for $\Delta\zeta_{5f}$ instead of the slight maximum for $\Delta\zeta_{4f}$.

The two-body parameters α and β did not exhibit any statistically significant systematic change in values over the series, but the trend in γ was to decrease in magnitude with increasing Z. This is opposite to the trend for this parameter exhibited in the Ln^{3+}:LaF_3 series. The values obtained for some of the 3-body operators showed small increases or decreases over the series. The fit values of P^2 appeared to parallel the trend to a negative slope seen in γ.

The agreement of computed with experimental energies for each actinide ion beyond U^{3+} was very good within the regular variation imposed on the F^k parameter values except for Cm^{3+} ($5f^7$). In this case the value of F^6 consistent with that used for other members of the series, Fig. 3, was ~4.5% smaller than that required to give an optimum fit of the data.

5.2 Crystal-field Parameters

In contrast to the behavior of the free-ion parameters where in a number of instances it was necessary to impose restrictions on their variation, the crystal-field parameters were varied freely in every case. It was characteristic of their behavior that the values determined from fitting a limited number of lower energy levels, which tended to be the states that were best identified

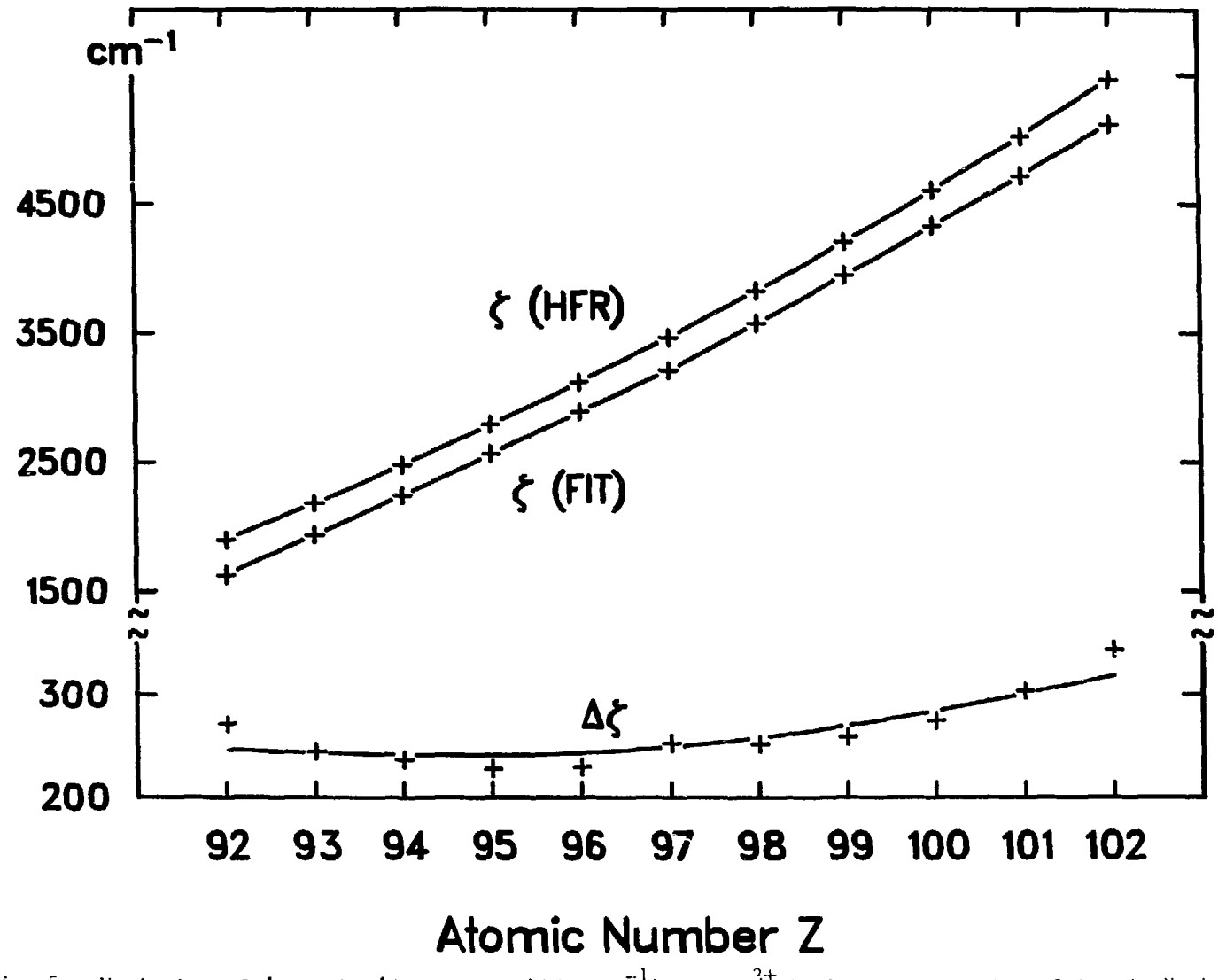

Fig. 5. Variation of ζ(EXPT), ζ(HFR) and $\Delta\zeta$(in cm^{-1}) for $An^{3+}:LaCl_3$ as a Function of Atomic Number.

experimentally, were not significantly modified as additional groups of higher energy states were included in the fitting procedure. In examining the parameter values in Table 3, it is apparent that the magnitude of B_0^2 increases slowly with increasing Z; the values obtained for the lighter actinides are comparable to those derived for most of the Ln^{3+}:$LaCl_3$.[1] In contrast, the other three parameters are approximately twice as large for An^{3+} as for Ln^{3+}.

In the context of the single-particle crystal-field model adopted here as well as in the Ln^{3+}:LaF_3 work[1], with ionic radii that are similar in the two series $AnCl_3$ and Ln^{3+}:$LaCl_3$, and with the same crystal structure, the stronger interaction between the central metal ion and its environment in the actinide compared to the lanthanide series is well accounted for by changes in the magnitude of the crystal-field parameters. The model is very useful in its ability to interpret in detail a large body of data. The larger crystal-field splittings in one sense magnify some of the problems encountered earlier in lanthanide spectra where the splittings were too small to support a choice between theoretical interpretations. Thus the present study tends to highlight deficiencies which at least in some cases are not without precedent. It is important to emphasize that in the crystal-field analysis of light actinide spectra, where differences were found in the energies of transitions to the same state in An^{3+}:$LaCl_3$ and $AnCl_3$, to the extent that comparisons could be made, the effect could be attributed to differences in the free-ion structure. The crystal-field splittings in the two cases were reproduced by a single set of crystal-field parameters.

The existence of a drop in the magnitude of the sixth-rank crystal-field parameters, B_q^6, for Ln^{3+}:$LaCl_3$ after the half-filled shell ($4f^7$) was pointed out some years ago, and interpreted as an inadequacy of a crystal-field Hamiltonian which only contains sums of single-electron operators.[30] The recent determination of crystal-field parameters for Ln^{3+}:LaF_3 provided additional experimental evidence for an abrupt change in both the fourth and sixth degree terms, Fig. 6. In Ln^{3+}:$LaCl_3$, the shift in B_0^4 was not apparent.

Examination of series trends in crystal-field parameters for An^{3+}:$LaCl_3$, Fig. 7, reveals a parallel variation of B_0^2 for An^{3+}:$LaCl_3$ and Ln^{3+}:$LaCl_3$. Both systems show generally increasing values of the parameter with increasing Z. As indicated earlier, U^{3+} must be excluded from these comparisons. In B_0^4 and B_0^6, there is a definite break at $5f^7$. The crystal-field parameters determined for Bk^{3+}:$LaCl_3$ were used to compute the splitting in Cm^{3+}:$LaCl_3$, as was the case for the analogous lanthanide ions, Tb^{3+} and Gd^{3+}:LaF_3. In Ln^{3+}:LaF_3, the parameters for either Tb^{3+} or Eu^{3+} provided a satisfactory fit of the crystal-field for Gd^{3+}:LaF_3; in An^{3+}:$LaCl_3$, the Bk^{3+} set provided a statistically better fit than did that for Am^{3+}:$LaCl_3$. The variation of B_6^6 with Z for

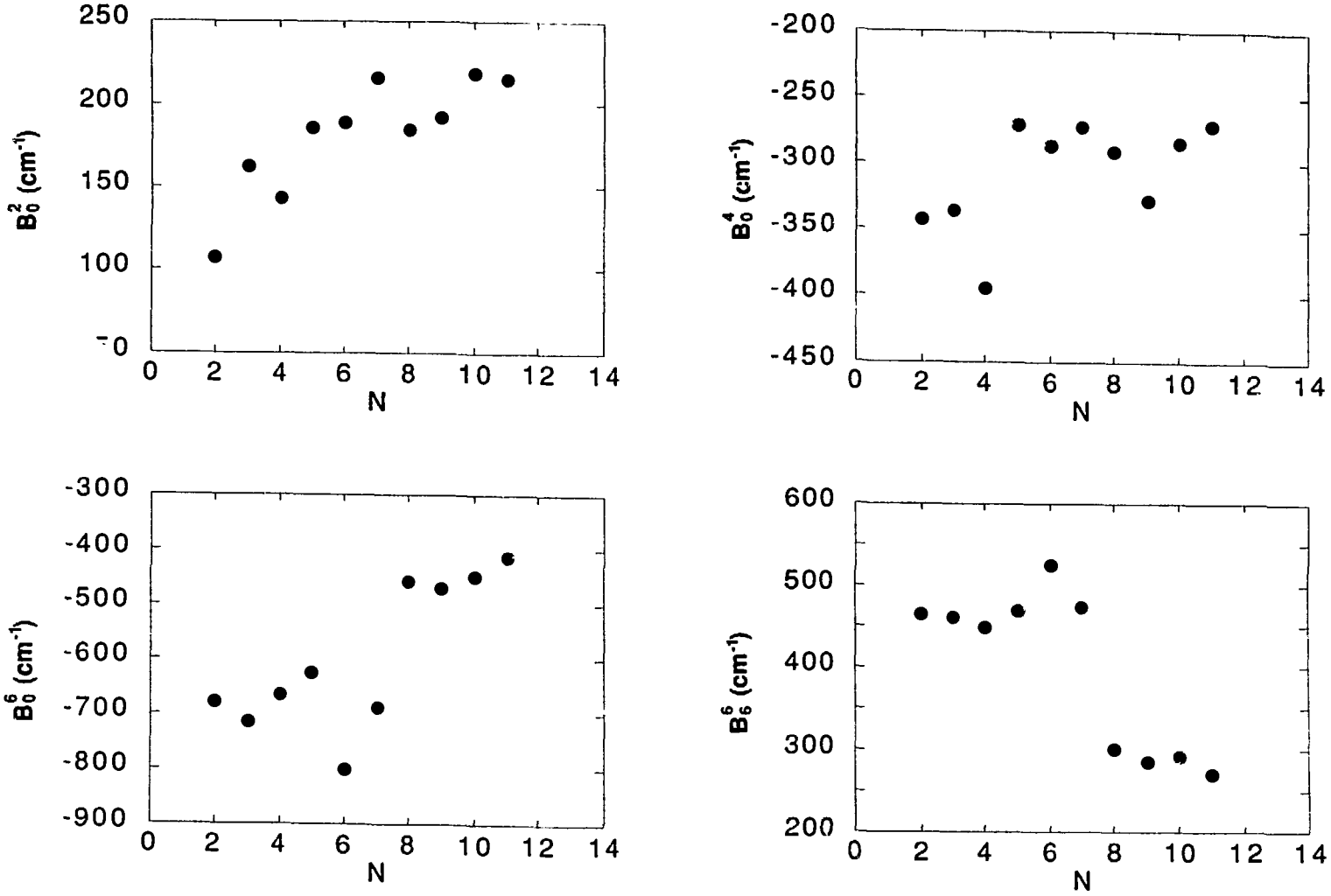

Fig. 6. Variation of the Crystal-field Parameters B_0^2, B_0^4, B_0^6 and B_6^6 (in cm^{-1}) for Ln^{3+}:$LaCl_3$ as a Function of Atomic Number.

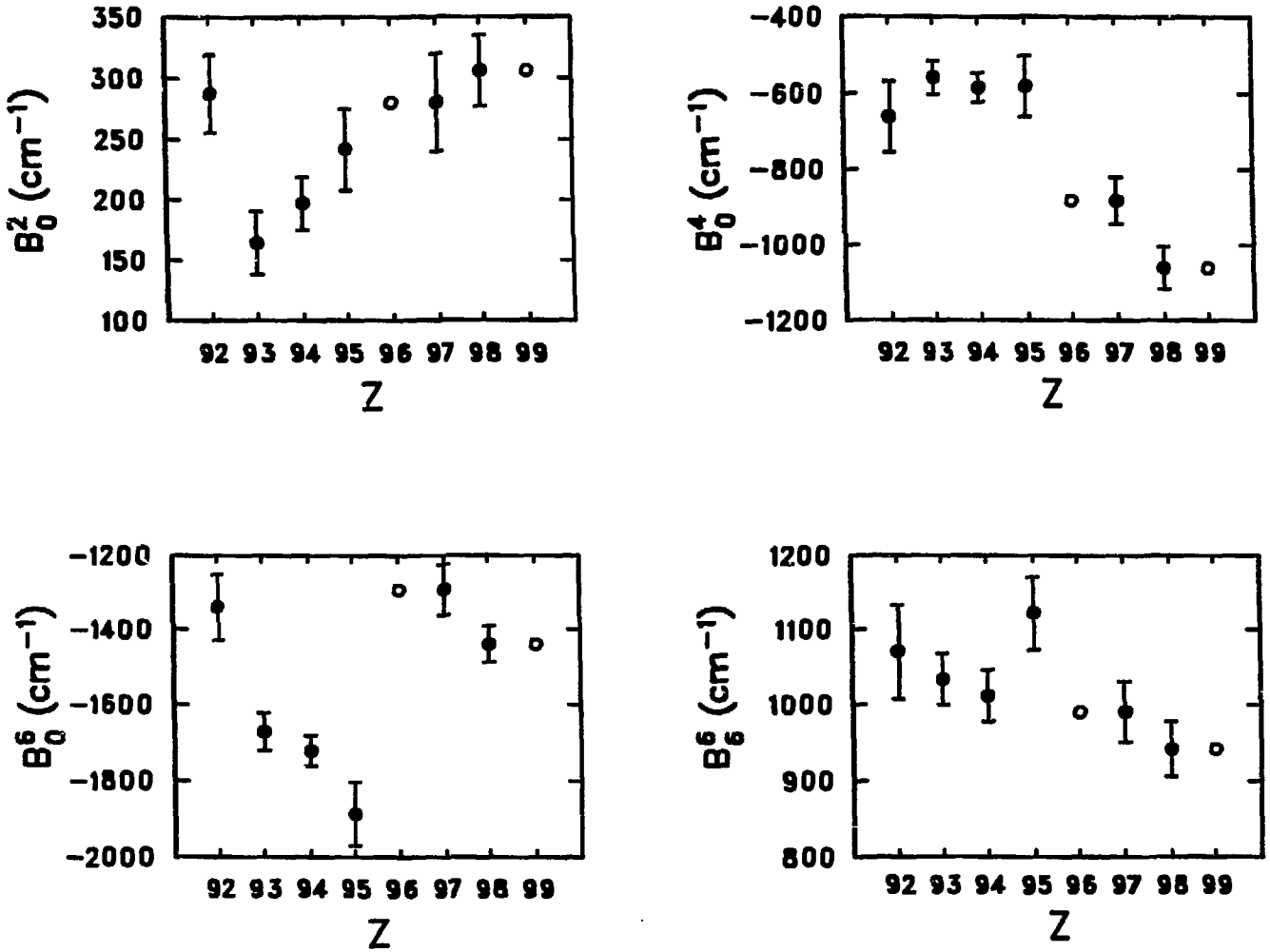

Fig. 7. Variation of the Crystal-field Parameters B_0^2, B_0^4, B_0^6 and B_6^6 (in cm^{-1}) for An^{3+}:$LaCl_3$ as a Function of Atomic Number.

An^{3+}:$LaCl_3$ does not parallel trends observed in either Ln^{3+}:$LaCl_3$ or Ln^{3+}:LaF_3, Fig. 7. Only the value for Am^{3+} is exceptional.

The variability of the crystal-field parameters for An^{3+}:$LaCl_3$/$AnCl_3$ along the series is clearly greater than that characteristic of Ln^{3+}:$LaCl_3$, and indeed the errors involved, both in the individual parameters and the fit of theory to the experimental data are larger. The parallel observations made to the La^{3+}:$LaCl_3$ data, and in the case of B_6^6 , the contrasting observation, should be useful in the continuing effort to develop appropriate modifications of the single-particle model. However it is important to emphasize at this point that modifications of the model which result in the introduction of additional parameters will be difficult to justify. With the present four parameter fits, there is no change in the deviation (σ), Table 3, over the series, nor was there a change in σ over the Ln^{3+}:LaF_3 series.[1] To be able to significantly improve a series average value of σ of 10-12 for Ln^{3+}:LaF_3, or 20-22 for An^{3+}:$LaCl_3$, seems unlikely. These averages may even overstate the error attributable to the mismatch of computed and observed crystal-field level energies. Some mismatch can be attributed to a deficiency in the ability of the free-ion Hamiltonian to yield the optimum center of gravity to fit the observed crystal-field components. Thus the crystal-field Hamiltonian as it is presently constituted is not so much in need of revision to improve correlation with the experimental data it addresses, but rather to achieve better correlation with what we perceive as an interaction that should vary uniformly over the series.

In discussing the spectra of $NpCl_3$ and $NpBr_3$,[12] we pointed out that based upon data then available, there appeared to be a similar ordering in terms of crystal quantum number in the ground states of many iso f-electronic Ln^{3+} and An^{3+} ions in UCl_3-type crystal lattices. The current investigation confirms the validity of this generalization in detail for many cases and for the first 2-3 states in every case except Dy^{3+}:$LaCl_3$/Cf^{3+}:$LaCl_3$, Fig. 8. In Dy^{3+}:$LaCl_3$, several crystal-field components just above the ground $\mu = 3/2$ state are both observed and computed to have essentially the same energy.[31] The ground state structure in Cf^{3+}:$LaCl_3$ is not limited to such a narrow energy range, but additional experiments are required to experimentally establish the energy level ordering.

5.3 Computed Energy Level Structures for An^{3+}:$LaCl_3$.

Following the practice adopted in summarizing the energy level structures for Ln^{3+}:LaF_3,[1] a new chart of the structures for An^{3+}:$LaCl_3$ has been prepared, Figure 9. It is based on computed energy level schemes. This then includes many levels that have not yet been observed experimentally. As in the Ln^{3+}:LaF_3 chart, at higher energies only the energy gaps between

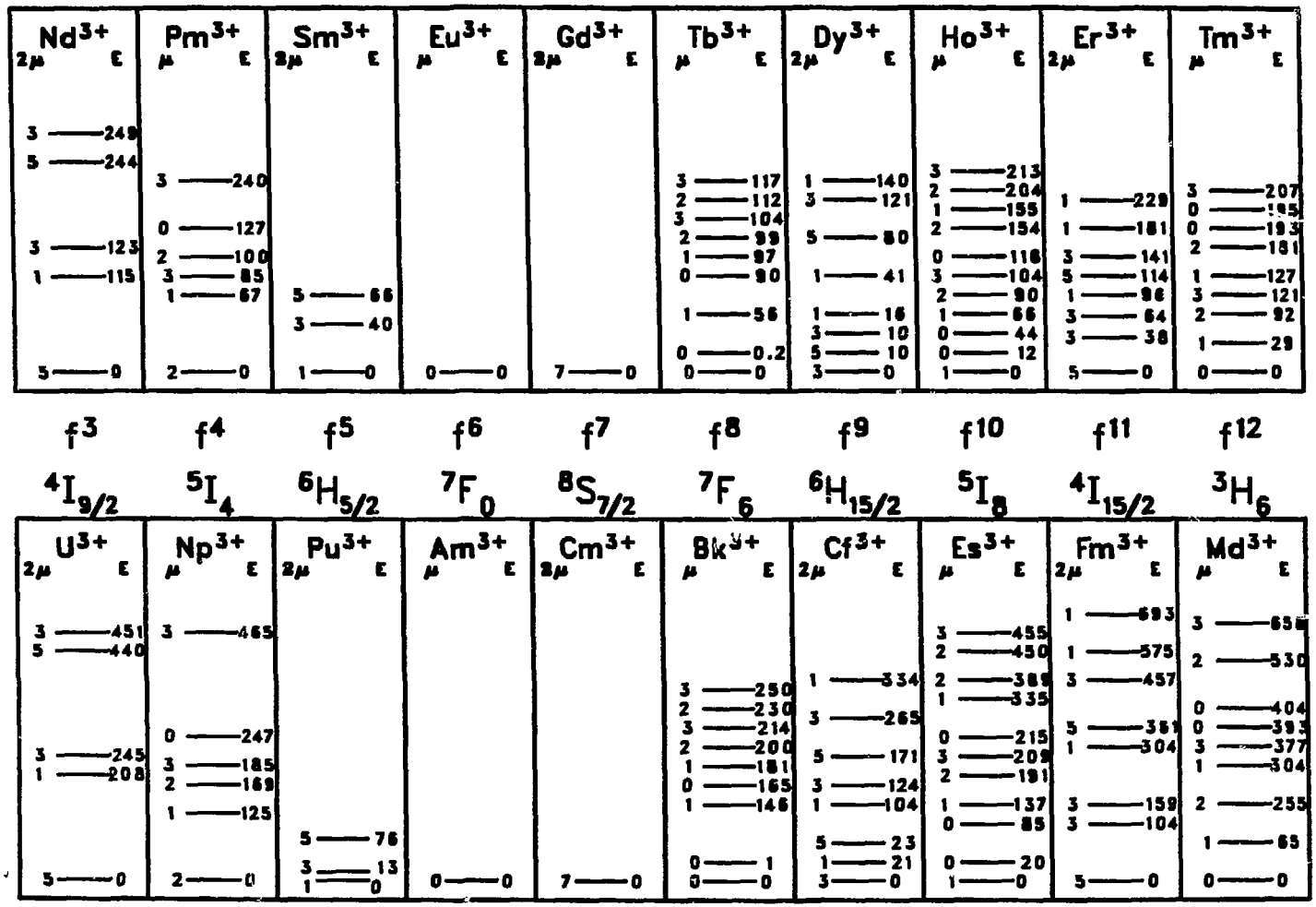

Fig. 8. Comparison of the Ground State Crystal-field Splittings in Ln^{3+}:$LaCl_3$ (Refs. 2,31) and An^{3+}:$LaCl_3$ (E in cm^{-1}). Computed Level Energies are Inserted Where No Experimental Measurement has been Reported.

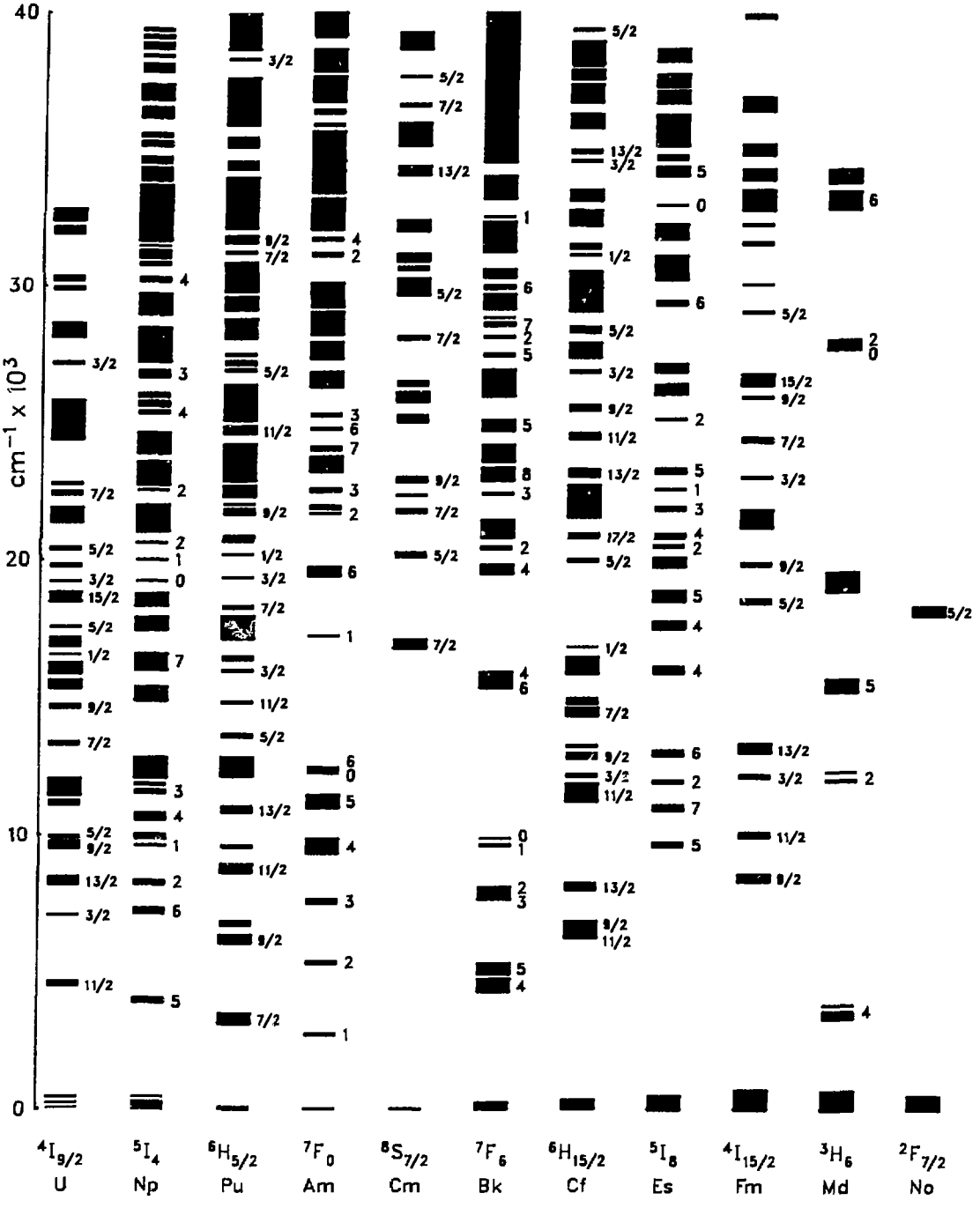

Fig. 9. Energy Level Structure of $An^{3+}:LaCl_3$ Based on Computed Crystal-field Energies in the Range 0-40000 cm^{-1}.

groups of levels are emphasized. In the lower energy range many of the crystal field levels are sufficiently separated in energy to be resolved; black areas indicate the span of crystal-field levels that could not be resolved on the indicated energy scale. The state labels shown for certain isolated states follow the convention adopted for labeling states in the appendices.

5.4 Nephelauxetic Shifts

The shift of observed energy level structure in both d- and f-transition ion spectra toward smaller wavenumber in a condensed phase compared to corresponding structure in the gaseous free-ion, the nephelauxetic effect, is well documented. The extent of the shift can be correlated with the strength of covalent bonding of the ligands involved. As Joergensen[32] has pointed out, the shift can be attributed to an expansion of the d or f radial wavefunction arising from a modified central field. Additional screening of the field is contributed by electronic density from the ligands. In practice some standard of comparison other than the gaseous free-ion is used and two classes of shifts are recognized: (1) Shifts observed in the spectra of the same ion in a series of different bonding conditions, and (2) relative shifts observed over a series with the same complexing ligand, the series nephelauxetic effect.

In the lanthanides, the shifts for many complexes relative to the Ln^{3+}(aquo) structure have been determined. The largest shifts occur at the beginning of the series with magnitudes decreasing rapidly as a function of increasing Z.[32] Nephelauxetic shifts have also been identified in the spectra of actinide ions as a function of different ligand environments,[12,19] but the present results are the first to encompass both light and heavy members of the 5f series.

Since it was found that the crystal-field components of a particular J-state in the actinide chloride spectra usually exhibited a common shift energy, ΔE_N, with respect to the components of An^{3+}:$LaCl_3$, this shift could be used in some cases as one means of selecting an observed transition in the neat compound from among several bands of comparable intensity as the electronic transition. Corrections could also be made in some cases to translate the energy of a band observed in the neat compound into the energy of a corresponding band in the doped crystal spectrum. In Appendix II, for example, numerous comparisons can be made showing that transitions observed in $NpCl_3$ are shifted to smaller wavenumbers compared to the same transitions in Np^{3+}:$LaCl_3$. The energy difference, ΔE_N, is clearly not constant from one J-manifold to another, but irregularly increases with the energy of the excited state up to a maximum of 60-80 cm^{-1} within the energy range in which we could make any meaningful comparison, Figure 10. It was evident for the actinide systems studied that just as is characteristic of the shifts

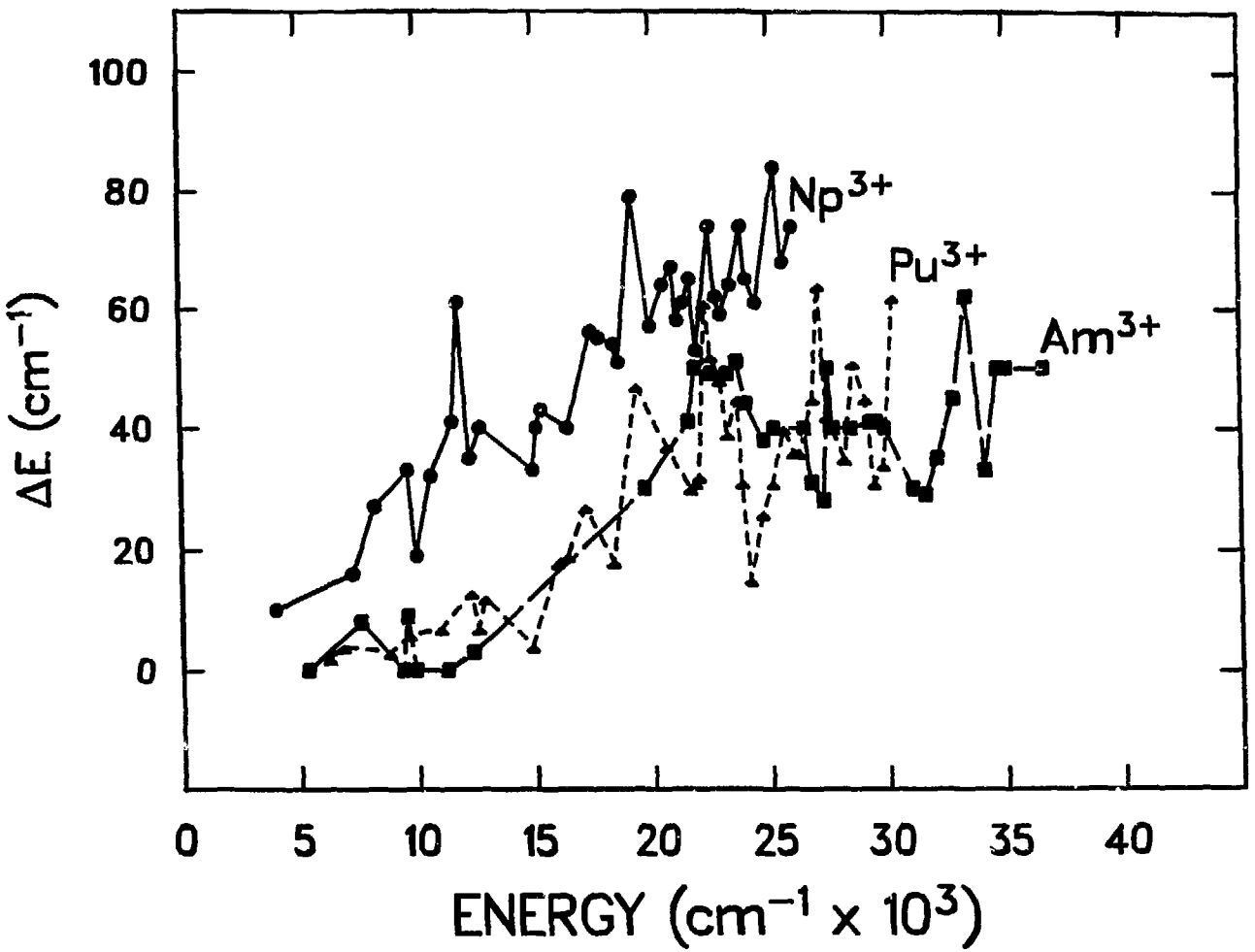

Fig. 10. Variation of $E_N = E(An^{3+}:LaCl_3)-E(AnCl_3)$ for Various States for Np^{3+}, Pu^{3+}, and Am^{3+} as a Function of Excited State Energy (cm^{-1}).

observed in the spectra of lanthanide compounds,[32] it is the J-state energies. which in turn are dependent upon the F^k parameters, that decrease.

In comparing shifts in energy over the 5f-series, as shown in Figure 10, there is a qualitative decrease within the lighter actinides, but this decrease appears to be considerably less abrupt than that characteristic of the lanthanides. The conclusion that shifts in the actinide chlorides are not evident for the heavier members of the series can be taken as consistent with observations in the Ln^{3+}:$LaCl_3$/Ln^{3+}:$LaBr_3$ system where for Ln = Er, the shifts are very small, albeit actually still detectable.[32] Thus a general picture consistent with results for both the 4f and 5f series is one of decreasing nephelauxetic shift as a function of Z with more change evident near the beginning of the 4f series compared to a less abrupt change for the 5f-series. In both cases the shifts are either very small in comparison or not discernable for the members of the series heavier than f^7 (Cm^{3+}, Gd^{3+}).

If we were dealing with shifts in the spectrum of An^{3+}:$LaBr_3$ compared to that of An^{3+}:$LaCl_3$, exhibiting the trends just identified, with considerable precedent we would invoke covalency or bonding as the basis for the shifts, and similarly attribute the lack of shifts in the heavier members of both series to f-electron localization. In view of both the small shifts involved and the close structural relationships in the An^{3+}:$LaCl_3$ and $AnCl_3$ systems, a suggested mechanism(s) for the shifts is more elusive; however, it is worth noting that the trends identified are also apparent within the same regions of the Ln and An series when other property measurements are compared.

6.0 DISCUSSION OF CORRELATIONS

Much has been written about the change in bonding character in both d- and f-transition metals and their alloys as a function of Z with respect to magnetic properties. Band structure calculations carried out by Hill [33] and subsequently expanded upon by others [34] confirm a metallic 5f-electron behavior (bonding) in the light actinide metals and alloys where experiment indicates the absence of local magnetic moments. With increasing Z there is a transition to localized f-electron character and experimentally the appearance of local magnetic moments in the heavier members of the series. The transition region lies near Pu-Am. Johansson and coworkers[35] have argued that a similar transition region is found in the lanthanide metals with Pr as the lanthanide analog most similar to the actinide Am. Here the changes in bonding character refer to the metallic state whereas the very similar conclusions with respect to changeover range deduced from series nephelauxetic effects dealt with trivalent ions.

Another interpretation of properties of the f-elements that yields evidence of a change in character near the center of the 5f-series comes from the analysis of transition intensities in optical spectra. Systematic measurements of absorption band intensities for Ln^{3+}(aquo) and An^{3+}(aquo) have been interpreted in terms of the Judd-Ofelt theory.[36] The empirical parameters of this theory which result from fitting experimental band intensities, have further been compared to those derived by direct calculation of the model parameters from first principles. In this way it was possible to show that variations in the intensity parameters over the whole of the Ln^{3+} (aquo) and An^{3+}(aquo) series correlated directly with changes in magnitude of one term in the model, the term involving radial moment integrals of the form $(nf\,|r^k|\,n'd)$.[36,37] The magnitude of these integrals decreases rapidly over the light members of the An^{3+} series. Values for Am^{3+} and Cm^{3+} represent a transition to the much smaller integrals characteristic of Bk^{3+}, Cf^{3+} and Es^{3+}. Based on observation of anomalously intense transitions in Pr^{3+}(aquo) and Nd^{3+}(aquo), these two elements appear to occupy a position in the Ln^{3+} series comparable to that of Am^{3+} and Cm^{3+} in the An^{3+} series. Thus in terms of transition intensities, there is a change in magnitude of the intensity parameters for both Ln^{3+}(aquo) and An^{3+}(aquo) that can be said to exhibit a crossover region in each series that closely parallels that identified with nephelauxetic shifts in the spectra of the Ln^{3+} and An^{3+} chlorides.

In both the intensity and nephelauxetic shift measurements, interpretation is made in terms of free-ion interactions, not in the (crystal-field) detail of the immediate ionic environment. The magnitude of the series nephelauxetic effects is certainly dependent upon the nature of the ligands, but it is the trends that are being emphasized here. We have drawn attention to one structurally unique system, the chlorides, where comparisons can be made over the whole actinide series, but the trend in shifts of energy is interpreted in terms of changing values of the F^k integrals. Similarly, the intensity analysis cited for Ln^{3+}(aquo) and An^{3+}(aquo) sums over both electronic and vibronic transitions, and addresses the integrated result in terms of free-ion eigenvectors. Examination of Judd's theory reveals that the term that varies directly with the intensity parameters is correlated with moment integrals of a particular class. These integrals reflect a mixing into the f^N-configuration of some of the character of other opposite parity configurations. Of the latter class, the $f^{N-1}d$ configuration for all trivalent lanthanide and actinide ions is energetically the lowest-lying configuration above f^N, and the one with which interaction is expected to be the strongest.

It was shown earlier, Fig. 3, that when the magnitudes of the F^k integrals were compared, those for U^{3+} appeared to be disproportionately smaller than for Np^{3+} and the series members heavier than Np^{3+}. There are probably several different mechanisms that could be invoked to

explain this apparent anomaly, and indeed multiple mechanisms may make important contributions. Discussion of some aspects of configuration interaction relative to this case is appropriate.

When the F^k are treated as parameters, they automatically absorb some of the effects of configuration interaction. In adding two- and three-body correction terms to the atomic Hamiltonian, the attempt was made to explicitly parameterize the interactions of classes of configurations that could modify the structure of an f^N configuration; all of these have the same parity as the f^N-configuration. The effects of configurations of parity opposite to f^N do not directly modify the structure of the f^N-configuration. In terms of two-body parameter values, Table 3, there is no discontinuity in U^{3+} compared to other members of the series. However, several, not all, of the three-body values are inconsistent with those found for other series members. This is evident in view of the consistent trends in the values of the two and three-body parameters over the series. Thus the distortion in the free-ion parameter values is not limited to the F^k for U^{3+}. One additional characteristic which sets U^{3+}apart from other members of the series is the very low energy of the $5f^26d$-configuration. While it can directly influence the intensity of transitions in the $5f^3$-configuration, any structural effects would have to involve an additional odd-rank interaction. Recent work of Garcia and Faucher showed that structural modifications in $PrCl_3$ ($4f^2$) could be introduced by considering configuration interaction between $4f^2$ and 4f5d mediated by the odd rank crystal-field parameters.[38] Mechanisms such as this may be important in the present case.

7.0 INTENSITY CALCULATIONS FOR TRIVALENT ACTINIDE IONS

The subject of intensity calculations was referred to in Section 6.0 when correlations invoking the parameters of such calculations were discussed. In keeping with our interest in utilization of the results of the present systematic study of energy level structure, a short summary of the basic concepts involved in intensity analyses is given in this section together with tables of matrix elements which permit one to adapt the calculation of intensities to any trivalent actinide compounds of interest. The basic approach has already been outlined in references 36 and 37, as well as in the original publications of Judd[39] and Ofelt.[40]

The following description deals exclusively with transitions between atomic states, i.e., absorption-fluorescence spectra typically observed at room temperature where the band structure is a composite of the individual crystal-field component electronic and vibronic transitions. The observed transition intensities are quantitatively described by relating an experimental quantity, a normalized band envelope, P_{EXPT}, to a theoretical model which describes the intensity in terms of magnetic dipole (P_{MD}) and induced electric-dipole (P_{ED}) mechanisms:

$$P_{EXPT} = P_{ED} + P_{MD}$$

Closed expressions for the computation of P_{MD} have long been available. The breakthrough in band intensity analysis came with publication of the theory of Judd and Ofelt which provided a model for relating P_{ED} to P_{EXPT}.

There are numerous publications including that by Judd[39] which provide examples of the application of the theory to experiment. A review of intensity calculations for Ln^{3+}(aquo) which includes relevant expressions of use to the experimentalist has also been published.[41] Therefore, the present discussion is limited to writing expressions for P_{ED} and P_{MD} for the absorption of energy (transitions arising from the ground state), in the terms most commonly employed in the recent literature:

$$P_{ED} = \frac{8\pi^2 mc\sigma}{3h(2J+1)}\left[\frac{(n^2+2)^2}{9n}\right]\sum_{\lambda=2,4,6}\Omega_\lambda\,(\psi J\|U^{(\lambda)}\|\psi' J')^2 \qquad (2)$$

$$P_{MD} = \frac{2\pi^2\sigma n}{3hmc(2J+1)}\,(\psi J\|L+2S\|\psi' J')^2 \qquad (3)$$

In Appendices XII-XXI, the matrix elements $(\psi J\|U^{(\lambda)}\|\psi' J')^2$, abbreviated $(U\lambda)^2$, in eqn. (2) have been calculated based on eigenvectors derived from the atomic parameters given in Table 3, i.e. the crystal-field parameters were set equal to zero. Arbitrary limitations on the energy range covered were necessarily imposed. A similar tabulation for trivalent lanthanide ions was prepared some years ago.[42]

The entries in the tables are arranged in order of increasing J-value for the initial state. Entries are not repeated. For example, the matrix element between an initial J = 9/2 and a final J = 3/2 state would be identical to the J = 3/2 → J = 9/2 entry. Only the latter is given. If the entry is missing from the table, the matrix elements are all zero. The entry 0.0 indicates that that matrix element is zero; the entry 0.0000 indicates that the matrix element has a value < 0.0001. Ofelt[40] has discussed the selection rules imposed on initial and final values of J to obtain non-zero values of $U^{(\lambda)}$; as is readily apparent from the appendices, $\Delta J \leq 6$. In the special case of $Am^{3+}(5f^6)$ where the ground state has J=0, $\Delta J \leq 6$ and even. That is, transitions from the ground to odd-J valued excited states all have zero matrix elements of $U^{(\lambda)}$. This obviously poses problems for the

intensity analysis of Am^{3+} where intensity associated with some transitions to odd-valued J-states is observed in solid halide spectra[19] as well as for $Am^{3+}(H_2O)$. [37]

In comparing the values of $(U\lambda)^2$ for Cm^{3+}(aquo) [43] with those computed for $Cm^{3+}:LaCl_3$, Appendix XVI, it is apparent that there are small differences. These differences arise because the values for the F^k are somewhat larger for the aquo ion spectrum than for $An^{3+}:LaCl_3$. Analyses of the intensities of transitions in the spectra of Bk^{3+}(aquo) [44] and Es^{3+}(aquo)[28] have also been published, and characteristic values of P_{EXPT} lie in the range $1\text{-}100\times10^{-6}$.

As indicated previously, closed expressions for P_{MD} are known, so computations of this contribution to P_{EXPT} can readily be made using the results of Table 3. Equation (3) for P_{MD} can be rewritten:

$$P_{MD} = \frac{2\pi^2\sigma n}{3hmc(2J+1)} \quad (\psi J\|L+2S\|\psi' J')^2$$

$$= \frac{4.04\times10^{-11}\,\sigma n(MD)^2}{2J+1} \qquad (4)$$

where σ (cm^{-1}) is the energy of the transition from state J1 to J2, n is the refractive index of the medium, and $(MD)^2 = (\psi J\|L+2S\|\psi' J')^2$. The J in the expression is J1. For example, for $U^{3+}:LaCl_3$, examining the transition from J1 (ground)($^4I_{9/2}$) to J2 ($^4I_{11/2}$) at 4563 cm^{-1}, we compute $(MD)^2 = 16.87$. Thus $P_{MD}/n = 0.31\times10^{-6}$. Considering the usual magnitude of P_{EXPT}, this is a small contribution. Consequently in Appendix XXII the tabulation of values of $(MD)^2$ is limited to $(MD)^2 \geq 10$ for transitions within the indicated ranges of energy.

8.0 CONCLUSIONS

While the changes over the 5f-series in many of the parameters belonging to the atomic part of the effective operator Hamiltonian were similar to those found in an earlier analysis of the 4f-series,[1] the unique character of both atomic and crystal-field parameters for U^{3+} was clearly demonstrated. In the course of developing the analysis it was possible to utilize the close relationship between spectroscopic observations for individual $An^{3+}:LaCl_3$ and $AnCl_3$. It was found that shifts in energy of each of the individual crystal-field components in a particular J-state, $\Delta E_N = E(An^{3+}:LaCl_3) - E(AnCl_3)$, were usually the same. This could be interpreted as evidence for a common crystal-field interaction but somewhat different atomic interactions in the two matrices.

Consistent with an anomaly in the results for $Ln^{3+}:LaCl_3$ which had been identified earlier, abrupt changes in some of the crystal-field parameters were found to occur near the center of the $5f^N$-series. While methods of addressing this effect have been discussed, see for example Ref. 1, it is important to emphasize that the single-electron operator approach to describing the crystal-field does in fact provide the basis for computing transition energies in good agreement with experiment over the whole of the Ln^{3+} and An^{3+}-series. In this sense the existence of parameters of different magnitude for the light and heavy halves of a series is a conceptual, not a practical problem to be remedied with additional parameters.

9.0 ACKNOWLEDGEMENTS

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Appendix I.

Experimental and Computed Energy Level Structure for $U^{3+}:LaCl_3$

SLJ[a] State	Expt'l[b] (cm^{-1})	Calc.[c] (cm^{-1})	E-C	2μ
$^4I_{9/2}$	0	41	-41	5
	208	224	-16	1
	245	228	16	3
	440	419	21	5
	451	439	13	3
$^4I_{11/2}$	4446	4455	-11	3
	4508	4494	14	1
	4556	4534	22	5
	4564	4580	-16	3
	4580	4585	-5	1
	-	4605		5
$^4F_{3/2}$	7081	7061	20	1
	7099	7069	30	3
$^4I_{13/2}$	8133	8135	-2	1
	8242	8217	25	3
	8266	8264	2	1
	-	8269		5
	8332	8341	-9	1
	8355	8357	-2	3
	-	8418		5
$^2H_{9/2}$	9492	9480	12	5
	9444	9502	-58	3

Appendix I. (cont.)

SLJ[a] State	Expt'l[b] (cm^{-1})	Calc.[c] (cm^{-1})	E-C	2μ
$^2H_{9/2}$	-	9626		1
	9648	9655	-7	3
	9763	9759	4	5
$^4F_{5/2}$	9889	9882	-3	3
	-	9900		5
	9969	9960	9	1
$^4G_{5/2}$,	11083	11082	1	1
$^4I_{15/2}$,	174	161	13	1
$^4S_{3/2}$	185	162	23	3
$^4F_{7/2}$	188	200	-12	1
$^4G_{5/2}$,	-	11204		5
$^4I_{15/2}$,	11247	262	-15	3
$^4S_{3/2}$	476	453	23	3
$^4F_{7/2}$,	-	475		1
	-	481		5
	-	554		1
	-	556		5
	578	599	-21	3
	-	643		5
	729	752	-23	1
	-	854		3
	-	913		3
	-	12011		5

Appendix I. (cont.)

SLJ[a] State	Expt'l[b] (cm^{-1})	Calc.[c] (cm^{-1})	E-C	2μ
$^4G_{7/2}$	13233	13256	-23	5
	294	267	27	3
	320	330	-10	5
	344	392	-48	1
$^4F_{9/2}$	-	14621		5
	14675	675	0	1
	689	697	-8	3
	-	704		5
	701	747	-46	3
$^2H_{11/2}$	15420	15350	70	1
	413	419	-6	3
$^2H_{11/2}$	15459	15448	11	3
	454	450	4	1
	-	511		5
	-	628		5
$^4D_{3/2}$	15823	15875	-52	1
	879	878	1	3
$^2K_{13/2}$	15960	15991	-31	1
	-	16065		5
	16090	093	-3	3

Appendix I. (cont.)

SLJ[a] State	Expt'l[b] (cm^{-1})	Calc.[c] (cm^{-1})	E-C	2μ
$^2K_{13/2}$	16072	16134	-62	5
	-	134		1
	-	216		3
	241	234	7	1
$^4D_{1/2}$	-	16533		1
$^4G_{9/2}$, $^2G_{7/2}$	-	16821		5
	16860	837	23	3
	891	859	32	3
	926	899	27	1
	-	938		5
	969	981	-12	1
$^4G_{9/2}$, $^2G_{7/2}$	17016	16995	21	3
	-	17031		5
	-	141		5
$^4D_{5/2}$	-	17532		5
	17533	538	-5	3
	-	592		1
$^2K_{15/2}$	18556	18514	42	1
	579	594	-15	3
	634	603	31	1
	688	670	18	3
	-	682		5

Appendix I. (cont.)

SLJ[a] State	Expt'l[b] (cm^{-1})	Calc.[c] (cm^{-1})	E-C	2μ
$^2K_{15/2}$	18752	18729	23	1
	805	784	21	3
	–	825		5
$^4D_{3/2}$	19200	19196	4	1
	–	224		3
$^2H_{11/2}$	19737	19758	-21	3
	751	724	27	1
	–	763		1
	–	777		3
	–	782		5
	–	802		5

SLJ[a] State	Expt'l[b] (cm^{-1})	Calc.[c] (cm^{-1})	E-C	2μ
$^2D_{5/2}$	–	20310		1
	–	353		3
	–	411		5
$^2I_{11/2}$,	–	21313		5
$^2G_{9/2}$,	21292	376	-84	1
$^2P_{1/2}$	397	382	15	3
	–	464		3
	498	465	33	1
	521	514	7	1
	549	550	-1	3
	–	561		5
	647	622	25	1

Appendix I. (cont.)

SLJ[a] State	Expt'l[b] (cm^{-1})	Calc.[c] (cm^{-1})	E-C	2μ
$^2I_{11/2}$,	-	21693		5
$^2G_{9/2}$,	21789	758	31	3
$^2P_{1/2}$	-	886		5
$^4D_{7/2}$	-	22352		5
	-	483		5
	-	491		3
	-	512		1
$^2D_{3/2}$	22772	22754	-18	3
	824	815	9	1
$^2I_{13/2}$,	-	24377		1
$^2I_{15/2}$,	-	437		1
$^2H_{9/2}$	-	442		3
	-	454		5
	24514	513	1	3
	-	565		5
	565	590	-25	1
	607	611	-4	3
	-	636		5
	-	682		3
	704	695	9	1
	-	768		5
	760	786	-26	1

Appendix I. (cont.)

SLJ[a] State	Expt'l[b] (cm^{-1})	Calc.[c] (cm^{-1})	E-C	2μ
$^2I_{13/2}$,	-	24870		3
$^2L_{15/2}$,	-	875		5
$^2H_{9/2}$	24902	915	-13	3
	-	952		5
	25077	25056	21	1
	-	070		3
	-	111		1
$^2L_{17/2}$,	-	25174		5
$^2F_{5/2}$	25223	218	5	3
$^2L_{17/2}$,	-	25247		1
$^2F_{5/2}$	-	368		5
	-	527		3
	-	544		3
	-	551		1
	-	568		5
	-	611		1
	-	684		5
	25723	746	-23	3
	796	792	4	1

[a]Nominal spectroscopic symbols for the free-ion state(s) parent of the crystal-field components in a given energy range from reference 9.

[b]These entries are primarily from Table V of reference 9, with rounding off of values and some changes in assignment. A few additional entries are included based on supplemental measurements. All values are reported in cm^{-1} vacuo.

[c]The energy level parameters used to generate these values are given in Table 3.

Appendix II.

Experimental and Computed Energy Level Structure for $Np^{3+}:LaCl_3/NpCl_3$

SLJ[a] State	Exp't.[b] (cm^{-1})	Calc.[c] (cm^{-1})	E-C	μ	I[d]	$NpCl_3$[e]	ΔE_N[f]
$^5I_4$	0	-18	18	2		0	
	125*	117	8	1		125	
	169*	177	-8	2		170	
	185*	165	20	3		190	
	[247]	247	0	0			
	465*	457	8	3			
$^5I_5$	3856	3848	8	0	4	3845	11
	874	874	0	1	8	863	11
	896	3900	-4	2	6	887	9
	3926	962	-36	1	9	3914	12
	960	983	-23	2	5	953	7
	987	995	-8	3	1		
	4017	4031	-14	3			
$^5I_6$	-	7121		0			
	7138	138	0	1		7125	13
	177	196	-19	1	6	156	21
	-	7200		0			
	187	205	-18	2	6	169	18
	-	231		0			
	223	238	-15	3			

Appendix II. (cont.)

SLJ[a] State	Expt'l.[b] (cm^{-1})	Calc.[c] (cm^{-1})	E-C	μ	I[d]	$NpCl_3$[e]	ΔE_N[f]
$^5I_6$	7264	7276	-12	2	4	7252	12
	-	302		3			
$^5F_2$	8139	8136	3	1	4	8108	31
	147	162	-15	2	6	124	23
	-	285		0			
$^5F_1$	9615	9584	31	1	7	9582	33
	621	610	11	0	7		
$^5I_7$	9864	9869	-5	3			
	879	887	-8	1	9	9857	22
	883	882	1	2	9		
	-	9924		3			
	9940	951	-11	1	7	923	17
	946	947	-1	2	9		
	988	983	5	0	8		
	10001	10008	-7	0	9	984	17
	005	9999	6	1			
	010	10028	-18	0			

Appendix II. (cont.)

SLJ[a] State	Expt'l.[b] (cm^{-1})	Calc.[c] (cm^{-1})	E-C	μ	I[d]	$NpCl_3$[e]	ΔE_N[f]
$^3H_4$	10567	10549	18	0	9	10536	31
	667	654	13	1	9	633	34
	692	681	11	2	9		
	-	694		3			
	-	774		3			
	-	806		2	1		
$^5F_3$	11498	11508	-10	2	9	11458	40
	563	525	38	0	2	522	41
	-	534		3			
	631	621	10	1	9	588	43
	-	634		3			
$^5G_2$	11820	11818	2	0	9		
	854	836	18	1	5	11793	61
	859	863	-4	2	9		
$^5I_8$,	12098	12077	21	2	8	12066	32
$^5S_2$,	110	089	21	3			
$^5G_3$	182	164	18	2	9	147	35
	186	176	10	1	9		

Appendix II. (cont.)

SLJ[a] State	Expt'l.[b] (cm^{-1})	Calc.[c] (cm^{-1})	E-C	μ	I[d]	$NpCl_3$[e]	ΔE_N[f]
$^5I_8$,	12285	12263	22	0	9	12252	33
$^5S_2$,	-	353		3			
$^5G_3$	409	388	21	1	8		
	419	395	24	2	8	380	39
	448	447	1	0	9		
	559	567	-8	0	9	528	31
	-	616		1			
	631	636	-5	2	8		
	657	663	-6	1	4		
	-	676		3			
	681	689	-8	0	7		
	699	698	1	0	7		
	731	737	-6	2	7	684	47
	-	751		3			
	816	784	32	1	9	773	43
$^3K_6$,	14888	14919	-31	1	9	14848	40
$^5F_5$,	905	903	2	2	9		
$^5F_4$	912	932	-20	3			

Appendix II. (cont.)

SLJ[a] State	Expt'l.[b] (cm^{-1})	Calc.[c] (cm^{-1})	E-C	μ	I[d]	$NpCl_3$[e]	ΔE_N[f]
$^3K_6$,	14989	15018	-29	0	8		
$^5F_5$,	991	14977	14	1	8		
$^5F_4$	15016	15034	-18	3			
	085	056	29	1	2		
	092	051	41	0	3	15052	40
	108	107	1	0	2		
	-	127		3			
	(15137)	128	9	2		097	40
	-	173		1			
	-	174		2			
	-	175		3		-	
	-	284		2			
	303	310	-7	2	7	258	45
	-	315		3			
	-	323		1			
	-	377		3			
	386	392	-6	0	8	345	41
$^3L_7$	16009	16003	6	3		-	
	014	051	-37	2	9		
	145	149	-4	1	2		

Appendix II. (cont.)

SLJ[a] State	Expt'l.[b] (cm^{-1})	Calc.[c] (cm^{-1})	E-C	μ	I[d]	$NpCl_3$[e]	ΔE_N[f]
$^3L_7$	-	16240		1			
	-	270		3			
	-	321		2			
	16320	353	-33	0	9	16274	46
	447	439	8	1			
	462	448	14	0	9	427	35
	582	555	27	0	9	543	39
$^5G_4$,	17408	17435	-27	0	9	17344	64
$^3M_8$	512	497	15	3			
	532	521	11	1	9	484	48
	535	523	12	2	9		
	-	540		3			
	542	552	-10	2	9		
	(17702)	711	-9	1		647	55
	-	741		2			
	738	747	-9	1	8		
	751	751	0	0	8	694	57
	-	767		2			
	795	783	12	0	8	741	54
	-	821		3			

Appendix II. (cont.)

SLJ[a] State	Expt'l.[b] (cm^{-1})	Calc.[c] (cm^{-1})	E-C	μ	I[d]	$NpCl_3$[e]	ΔE_N[f]
$^5G_4$,	-	17835		3			
$^3M_8$	-	866		2			
	17885	877	8	1	3	17830	55
	-	904		0			
$^3D_2$,	18364	18354	10	1	9	18310	54
$^5G_5$,	394	374	20	2	9	337	57
$^3G_2$,	436	451	-15	2	9	391	45
$^3G_3$	489	520	-31	0	9	431	58
	-	557		0			
	-	577		3			
	578	595	-17	1	9	524	54
	609	630	-21	0	6	561	48
	623	618	5	1	5		
	-	628		3			
	648	665	-17	2	3	596	52
	668	668	0	1	1		
	-	683		3			
	-	747		2			
	-	763		3			

Appendix II. (cont.)

SLJ[a] State	Expt'l.[b] (cm^{-1})	Calc.[c] (cm^{-1})	E-C	μ	I[d]	$NpCl_3$[e]	ΔE_N[f]
$^5D_0$	19227	19235	-8	0	9	19148	79
$^3P_1$	19999	19989	10	1	9	19942	57
	20001	995	6	0	9		
$^3F_2$	20520	20576	-56	0	5	20452	68
	593	586	7	2	2		
	608	571	37	1	8	549	59
$^3H_5$,	20986	20989	-3	0	7	20919	67
$^5G_6$,	21008	993	15	1	7		
$^3F_4$,	016	21009	7	1	8	949	67
$^3D_3$,	032	031	1	2	7		
$^3I_5$,	-	058		3			
$^5D_1$	-	105		3			
	126	109	17	2	8	21064	62
	-	159		3			
	230	237	-7	2	3		
	242	240	2	0	3		
	253	300	-47	0	9	198	55
	266	253	13	1	7		

Appendix II. (cont.)

SLJ[a] State	Expt'l.[b] (cm^{-1})	Calc.[c] (cm^{-1})	E-C	μ	I[d]	$NpCl_3$[e]	ΔE_N[f]
$^3H_5$,	-	21302		3			
$^5G_6$,	-	323		2			
$^3F_4$,	21343	327	16	1	7	21284	59
$^3D_3$,	377	357	20	2	1		
$^3I_5$,	-	380		3			
$^5D_1$	-	387		1			
	-	396		0			
	429	406	23	2	3	370	59
	-	420		3			
	450	435	15	0	4		
	-	479		3			
	-	492		3			
	-	529		0			
	529	531	-2	1	4		
	540	535	5	2	5	476	64
	-	606		0			
	-	622		1			
	655	660	-5	2	6	583	72
	-	693		3			
	710	695	15	0	2		
	717	740	-23	1	8	653	64

Appendix II. (cont.)

SLJ[a] State	Expt'l.[b] (cm^{-1})	Calc.[c] (cm^{-1})	E-C	μ	I[d]	$NpCl_3$[e]	ΔE_N[f]
$^3H_5$,	21770	21826	-56	1	8	21709	61
$^5G_6$,	854	876	-22	2	7	790	64
$^3F_4$,	-	932		3			
$^3D_3$,							
$^3I_5$,							
$^5D_1$							
$^3P_0$	21981	21973	8	0	9	21928	53
$^3F_2$	-	22535		0			
	22529	537	-8	2	9	22450	79
	609	561	48	1	9	541	68
$^3L_8$,	22738	22752	-14	1	9	22680	58
$^3K_7$,	-	802		0			
$^3M_9$,	814	815	-1	0	7	747	67
$^5D_2$	860	865	-5	1	8	799	61
	871	872	-1	2	3		
	-	926		3			
	933	943	-10	2	0		
	943	912	31	1	1		

Appendix II. (cont.)

SLJ[a] State	Expt'l.[b] (cm^{-1})	Calc.[c] (cm^{-1})	E-C	μ	I[d]	$NpCl_3$[e]	ΔE_N[f]
$^3L_8$,	-	22970		3			
$^3K_7$,	23002	997	5	0	1		
$^3M_9$,	015	23004	11	2	4	22956	59
$^5D_2$	-	019		0			
	-	087		1			
	-	107		3			
	-	109		3			
	-	119		2			
	-	156		0			
	-	191		0			
	-	199		1			
	-	209		3			
	-	223		2			
	-	243		3			
	-	247		0			
	253	296	-43	1	4	23201	52
	-	314		2			
	-	343		0			
	-	424		1			
	430	438	-8	2	6	363	67
	-	453		3			

Appendix 4I. (cont.)

SLJ[a] State	Expt'l.[b] (cm^{-1})	Calc.[c] (cm^{-1})	E-C	μ	I[d]	$NpCl_3$[e]	ΔE_N[f]
$^3L_8$,	-	23486		1			
$^3K_7$,	23501	499	2	2	9	23429	72
$^3M_9$,	-	509		0			
$^5D_2$	517	519	-2	2	9		
	521	504	17	1	9		
	528	521	7	0	9		
	-	529		3			
	-	564		1			
$^3I_6$,	-	23875		3			
$^3F_4$	23849	877	-28	0	9	23769	80
	899	901	-2	0	9	831	68
	951	910	41	2	2		
	982	973	9	2	5	922	60
	-	977		1			
	-	999		3			
	992	24017	-25	1	8		
	-	032	-2	0			
	24052	069	-17	2	3	974	78
	071	081	-10	0	3		
	141	095	46	2	3	24084	57

Appendix II. (cont.)

SLJ[a] State	Expt'l.[b] (cm^{-1})	Calc.[c] (cm^{-1})	E-C	μ	I[d]	$NpCl_3$[e]	ΔE_N[f]
$^3I_6$,	-	24112		3			
$^3F_4$	24175	169	6	1	1		
	-	240		3			
$^3K_8$	-	24400		0			
	24424	417	7	1	9		
	432	422	10	2	9	24371	61
	447	416	31	0	9		
	471	442	29	1	9	407	64
	-	455		3			
	474	491	-17	2	9		
	513	471	42	0	5		
	528	568	-40	2	4		
	532	503	29	1	8	473	59
	-	586		3			
$^3G_4$	-	25301		2			
	25329	348	-19	1	9	25245	84
	-	352		3			
	343	399	-56	0	4		

Appendix II. (cont.)

SLJ[a] State	Expt'l.[b] (cm^{-1})	Calc.[c] (cm^{-1})	E-C	μ	I[d]	$NpCl_3$[e]	ΔE_N[f]
$^3G_4$	25367	25362	5	2	9		
		407		3			
$^3H_6$,	25608	25576	32	1	5		
$^5D_3$	628	622	6	1	9		
	-	625		0			
	635	632	3	2	9	25562	73
	-	670		2			
	665	675	-10	0	9		
	-	690		3			
	-	691		3			
	-	716		3			
	-	722		3			
	707	737	-30	0	3		
	736	752	-16	2	9	673	63
	-	760		1			
	745	773	-28	0	9		
$^3I_7$	-	25935		1			
	-	981		0			
	-	998		3			

Appendix II. (cont.)

SLJ[a] State	Expt'l.[b] (cm^{-1})	Calc.[c] (cm^{-1})	E-C	μ	I[d]	$NpCl_3$[e]	ΔE_N[f]
$^3I_7$	-	26011		2			
	-	016		1			
	-	030		3			
	-	045		0			
	26083	083	0	0	8		
	108	088	20	2	8	26034	74
	116	092	24	1	8		

[a]The principal SLJ-component of the state is given as a label only since in many cases the state has < 50% of the indicated character. When the crystal-field components in a given energy range belong to several different J-states, those states are listed for the group only. No attempt is made to indicate the percentage of individual crystal-field components.

[b]Experimental data for $Np^{3+}:LaCl_3$ taken from reference 11. An asterisk indicates a level energy deduced from spectra observed in fluorescence, otherwise the data were obtained in absorption. Values in parentheses are from experimental results for $NpCl_3$ with an approximate correction, ΔE_N. All values are given in cm^{-1} vacuo. As discussed in Ref. 11, transitions from D_1 (I_1) to Z_5 [247 cm^{-1}] are forbidden, but weak bands consistent with this energy were observed from both emitting states.

Appendix II. (cont.)

[c]The energy level parameters used to compute these levels are given in Table 3.

[d]Estimated intensity (scale of 1-10) for $Np^{3+}:LaCl_3$ spectra from photographic plates, reference 11.

[e]Data taken from reference 12 and reported in cm^{-1} vacuo.

[f]ΔE_N = E($Np^{3+}:LaCl_3$) (Column 2) - E($NpCl_3$) (Column 7).

Appendix III.

Experimental and Computed Energy Level Structure for $Pu^{3+}:LaCl_3/PuCl_3$

SLJ[a] State	Expt'l.[b] (cm^{-1})	Calc.[c] (cm^{-1})	E-C	2μ	$Pu^{3+}:LaCl_3$[d] (cm^{-1})	$PuCl_3$[e] (cm^{-1})	ΔE_N[f]
$^6H_{5/2}$	0	-9	9	1	0		
	13	15	-2	3	13		
	76*	72	4	5			
$^6H_{7/2}$	3136*	3124	12	3			
	245*	240	5	5			
	380*	391	-11	1			
	469*	478	-9	5			
$^6H_{9/2}$	6081*	6082	-1	5	6082	6074	7
	101*	099	2	3	102	101	0
	170*	201	-31	1	172		
	(6202)	214	-12	3	202	202	0
	(6369)	350	19	5	369	371	0
$^6F_{5/2}$	6716*	6707	9	1	6717	6708	8
	753*	740	13	3	752	748	7
	(6787)	764	23	5	787	790	0
$^6F_{3/2}$	6827*	6815	12	3	6827	6830	0
	839*	827	12	1			

Appendix III. (cont.)

SLJ[a] State	Expt'l.[b] (cm^{-1})	Calc.[c] (cm^{-1})	E-C	2μ	$Pu^{3+}LaCl_3$[d] (cm^{-1})	$PuCl_3$[e] (cm^{-1})	ΔE_N[f]
$^6F_{1/2}$	6870*	6877	-7	1			
$^6H_{11/2}$	8602	8600	2	5	8602	8594	8
	721	723	-2	3	720	724	0
	724	731	-7	5	726		
	(8794)	779	15	1	794		
	-	854		1			
	889	881	8	3	888	888	1
$^6F_{7/2}$	9543	9549	-6	5	9545	9539	4
	547	558	-11	1	549		
	625	607	18	5	625	612	13
	630	621	9	3		628	2
$^6H_{13/2}$	10859	10850	9	5	10858		
	899	896	3	5	899	10892	0
	906	900	6	3			
	-	928		1			
	-	958		1			
	964	976	-12	3	964	962	2
	11055	11052	3	1		11037	18

Appendix III. (cont.)

SLJ[a] State	Expt'l.[b] (cm^{-1})	Calc.[c] (cm^{-1})	E-C	2μ	$Pu^{3+}LaCl_3$[d] (cm^{-1})	$PuCl_3$[e] (cm^{-1})	ΔE_N[f]
$^6F_{9/2}$	12128	12134	-6	3	12130	12117	11
	202	203	-1	3	204		
	230	228	2	5	232	220	10
	240	244	-4	1			
	368	349	19	1	370	362	18
$^6H_{15/2}$	12380	12369	11	5	380		
	(12459)	453	6	3	459		
	-	521		1			
	537	522	15	5	538	530	7
	-	594		3			
	-	613		1			
	782	754	28	5	782		
	808	789	19	3	805	796	12
$^6F_{5/2}$	13596	13578	18	3	13598		
	(13666)	668	-2	1	666		
	698	696	2	5			
$^6F_{11/2}$	14816	14831	-15	1	14813		
	844	869	-25	5	844		

Appendix III. (cont.)

SLJ[a] State	Expt'l.[b] (cm^{-1})	Calc.[c] (cm^{-1})	E-C	2μ	$Pu^{3+}LaCl_3$[d] (cm^{-1})	$PuCl_3$[e] (cm^{-1})	ΔE_N[f]
$^6F_{11/2}$	14847	14868	-21	3		14843	4
	893	874	19	1			
	864	881	-17	5	14861		
	879	887	-8	3	877		
$^4F_{3/2}$	15988	15971	17	3	15985	15970	18
	996	16012	-16	1	992		
$^4M_{15/2}$	16357	16375	-18	3	16359	16331	26
	382	404	-22	3	386	366	16
	393	409	-16	5			
	387	413	-26	1			
	-	416		1			
	418	459	-41	3			
	432	465	-33	5	435	417	15
	-	487		1			
$^6P_{5/2}$	17122	17130	-8	1			
	178	172	6	5	17180	17150	27
	176	174	2	3			

Appendix III. (cont.)

SLJ[a] State	Expt'l.[b] (cm^{-1})	Calc.[c] (cm^{-1})	E-C	2μ	$Pu^{3+}LaCl_3$[d] (cm^{-1})	$PuCl_3$[e] (cm^{-1})	ΔE_N[f]
$^4I_{9/2}$,	17205	17252	-47	3	17210		
$^4K_{11/2}$	(17315)	345	-30	5	315	17271	44
	(17375)	382	-7	5	375	355	20
	(17414)	424	-10	3	414	391	23
	-	425		1			
	(17464)	454	10	3	464	440	24
	-	493		1			
	(17577)	536	41	5	577	544	33
	-	678		1			
	(17682)	686	-4	3	682	661	21
	-	710		5			
$^4L_{13/2}$	-	17764		1			
	-	778		1			
	(17757)	791	-34	3	17757	17740	17
	-	821		5			
	-	854		1			
	-	913		3			
	-	949		5			

Appendix III. (cont.)

SLJ[a] State	Expt'l.[b] (cm^{-1})	Calc.[c] (cm^{-1})	E-C	2μ	$Pu^{3+}LaCl_3$[d] (cm^{-1})	$PuCl_3$[e] (cm^{-1})	ΔE_N[f]
$^4G_{7/2}$	18271	18274	-3	3	18276	18248	23
	296	277	19	5	300	275	21
	245	294	-49	1	249		
	333	345	-12	5	335	323	10
$^6P_{3/2}$	19363*	19363	0	3	19365	19316	47
	396*	384	12	1	398		
$^2P_{1/2}$	20190	20191	-1	1			
$^4M_{17/2}$	20625	20637	-12	5	20630	20584	41
	-	653		1			
	684	687	-3	3	690	644	40
	742	700	42	3	747	712	30
	793	749	44	5			
	-	776		1			
	-	829		5			
	-	835		1			
	825	847	-22	3	819		

Appendix III. (cont.)

SLJ[a] State	Expt'l.[b] (cm^{-1})	Calc.[c] (cm^{-1})	E-C	2μ	$Pu^{3+}LaCl_3$[d] (cm^{-1})	$PuCl_3$[e] (cm^{-1})	ΔE_N[f]
$^6G_{9/2}$	21644	21648	-4	5	21648	21615	29
	-	669		1			
	708	754	-46	3	713	678	30
	-	845		3	(21810)		
	(21889)	867	22	5	889	858	31
$^4F_{5/2}$	22036	22026	10	3	22040	22002	34
	-	034		1			
	071	054	17	5	079	041	30
$^4L_{15/2}$	22317	22315	2	5	22318		
	321	323	-2	3	320	257	64
	378	369	9	3			
	-	377		1			
	-	406		5			
	408	451	-43	3	408	346	62
	-	470		1			
	-	516		1			
$^4H_{7/2}$	22540	22574	-34	5	22547	22492	48
	613	601	12	3	622	553	60

Appendix III. (cont.)

SLJ[a] State	Expt'l.[b] (cm^{-1})	Calc.[c] (cm^{-1})	E-C	2μ	$Pu^{3+}LaCl_3$[d] (cm^{-1})	$PuCl_3$[e] (cm^{-1})	ΔE_N[f]
$^4H_{7/2}$	22641	22610	31	5		22593	48
	(22702)	708	-6	1	22702		
$^4F_{9/2}$,	-	22914		5			
$^4H_{11/2}$,	22957	929	28	3	22964	22909	48
$^6P_{7/2}$	(23031)	23026	5	3	23031		
	083	069	14	5	094	23052	31
	(23074)	072	2	1	074		
	185	187	-2	3	183	143	42
	197	198	-1	1			
	245	253	-8	5	249	201	44
	280	292	-12	3			
	294	301	-7	5	295	250	44
	-	305		1			
	342	345	-3	3	342		
	373	382	-9	5		337	36
	395	384	11	1	393		
	(23469)	472	-3	5	469		

Appendix III. (cont.)

SLJ[a] State	Expt'l.[b] (cm^{-1})	Calc.[c] (cm^{-1})	E-C	2μ	$PuLaCl_3$[d] (cm^{-1})	$PuCl_3$[e] (cm^{-1})	ΔE_N[f]
$^4L_{13/2}$,	-	23530		1	23541		
$^4P_{5/2}$,	23625	613	12	1			
$^4M_{9/2}$	(23617)	614	3	3	617	23568	49
	663	686	-23	5		635	34
	676	695	-19	3	672		
	719	704	15	5	703	668	51
	725	706	19	3			
	-	711		1			
	736	741	-5	5			
	-	742		1			
	773	756	17	5	774	738	35
	-	759		3			
	-	796		3			
	-	819		1			
	(23826)	822	4	5	826	798	28
	-	844		5			
	-	846		1			
	861	857	4	3	862	832	29
	-	880		1			
	-	914		5			

Appendix III. (cont.)

SLJ[a] State	Expt'l.[b] (cm^{-1})	Calc.[c] (cm^{-1})	E-C	2μ	$Pu^{3+}LaCl_3$[d] (cm^{-1})	$PuCl_3$[e] (cm^{-1})	ΔE_N[f]
$^4L_{15/2}$	-	24041		1			
	-	062		1			
	(24062)	064	-2	3	24062		
	088	104	-16	5		24079	9
	(24126)	128	-2	1	126		
	-	144		3		124	
	159	185	-26	3			
	191	187	4	5	193	169	22
$^4I_{11/2}$	24591	24594	-3	5	24611	24564	27
	693	668	25	3	696	667	26
	-	709		1			
	-	712		5			
	-	768		1			
	-	826		3		789	
$^4I_{13/2}$,	-	25072		1			
$^4D_{3/2}$	25064	082	-18	3	25065	25025	39
	(25131)	128	3	1	131		
	134	143	-9	5			

Appendix III. (cont.)

SLJ[a] State	Expt'l.[b] (cm^{-1})	Calc.[c] (cm^{-1})	E-C	2μ	$Pu^{3+}LaCl_3$[d] (cm^{-1})	$PuCl_3$[e] (cm^{-1})	ΔE_N[f]
$^4I_{13/2}$,	25187	25197	-10	5	25185	25157	30
$^4D_{3/2}$	220	212	8	3			
	-	265		1			
	246	270	-24	3	240	223	23
	-	284		1			
$^4M_{21/2}$,	-	25342		3			
$^4L_{17/2}$,	-	467		1			
$^4G_{7/2}$,	(25480)	470	10	5	480		
$^4H_{13/2}$	512	477	35	3	519		
	-	515		1			
	-	523		1			
	543	533	10	3	535	497	43
	-	535		5			
	558	559	-1	3			
	-	587		5			
	(25601)	603	-2	5	601		
	-	643		5		582	
	700	673	27	5	693	660	40
	-	679		3			
	-	698		1			

Appendix III. (cont.)

SLJ[a] State	Expt'l.[b] (cm^{-1})	Calc.[c] (cm^{-1})	E-C	2μ	$Pu^{3+}LaCl_3$[d] (cm^{-1})	$PuCl_3$[e] (cm^{-1})	ΔE_N[f]
$^4M_{21/2}$,	-	25704		3			
$^4L_{17/2}$,	-	741		5			
$^4G_{7/2}$,	-	753		3			
$^4H_{13/2}$	-	764		5			
	-	792		3			
	-	802		1			
	-	810		1			
	-	847		5		25780	
	-	877		3			
	-	883		1			
	-	895		5			
	-	919		1			
	-	938		1			
	-	941		3			
	-	959		1			
	-	988		5			
$^4H_{9/2}$,	(26038)	26061	-23	5	26038	25994	44
$^4G_{7/2}$	-	089		3			

Appendix III. (cont.)

SLJ[a] State	Expt'l.[b] (cm^{-1})	Calc.[c] (cm^{-1})	E-C	2μ	$Pu^{3+}LaCl_3$[d] (cm^{-1})	$PuCl_3$[e] (cm^{-1})	ΔE_N[f]
$^4H_{9/2}$,	-	26128		3			
$^4G_{7/2}$	26328	326	2	5		26281	47
	-	364		1			
	390	367	23	5	392	364	26
	422	406	16	3			
$^4G_{5/2}$	(26912)	26927	-15	3	26912	26867	45
	922	938	-16	5			
	-	990		1			
$^4G_{7/2}$,	27125	27141	-16	5		27056	74
$^4H_{11/2}$	135	150	-15	3	27137		
	-	162		5			
	-	164		1			
	174	176	-2	1		115	54
	164	181	-17	3			
	-	208		3			
	-	218		1			
	231	254	-23	5	233		
	-	292		5		221	

Appendix III. (cont.)

SLJ[a] State	Expt'l.[b] (cm^{-1})	Calc.[c] (cm^{-1})	E-C	2μ	$Pu^{3+}LaCl_3$[d] (cm^{-1})	$PuCl_3$[e] (cm^{-1})	ΔE_N[f]
$^2P_{3/2}$	27507	27501	6	3	27502	27465	42
	-	539		1			
$^4G_{11/2}$,	-	28084		1			
$^4F_{9/2}$	28125	094	31	3			
	132	095	37	5		28097	35
	142	118	24	5			
	-	180		1			
	201	196	5	3			
	-	216		1			
	220	233	-13	5	28228	185	35
	-	249		3			
	276	274	2	3		248	34
	297	289	8	5			
$^4P_{1/2}$,	-	28412		1			
$^4K_{17/2}$,	-	422		1			
$^4G_{9/2}$,	-	439		3			
$^4G_{5/2}$	-	479		3			
	-	496		5			
	28507	511	-4	3			

Appendix III. (cont.)

SLJ[a] State	Expt'l.[b] (cm^{-1})	Calc.[c] (cm^{-1})	E-C	2μ	$Pu^{3+}LaCl_3$[d] (cm^{-1})	$PuCl_3$[e] (cm^{-1})	ΔE_N[f]
$^4P_{1/2}$,	-	28519		1			
$^4K_{17/2}$,	28515	524	-9	5			
$^4G_{9/2}$,	556	536	20	5			
$^4G_{5/2}$	-	572		1			
	569	582	-13	3			
	606	616	-10	5	28611	28555	51
	-	625		1			
	-	681		3			
	-	687		3			
	-	694		1			
	701	695	6	5			
	771	743	28	5			
$^2D_{3/2}$	29098	29098	0	3		29053	45
	117	137	-20	1	29112		
$^4K_{15/2}$	29224	29251	-27	3			
	347	352	-5	5		29304	43
	-	369		1			
	446	453	-7	5			
	-	457		1			

Appendix III. (cont.)

SLJ[a] State	Expt'l.[b] (cm^{-1})	Calc.[c] (cm^{-1})	E-C	2μ	$Pu^{3+}LaCl_3$[d] (cm^{-1})	$PuCl_3$[e] (cm^{-1})	ΔE_N[f]
$^4K_{15/2}$	29463	29466	-3	3		29423	40
	-	467		1			
	496	497	-1	3			
$^4F_{5/2}$	-	29540		3			
	29552	558	-6	5		542	10
	-	563		1			
$^4I_{15/2}$	29813	29791	22	3			
	826	796	30	5	29815	800	26
	885	874	11	3			
	-	964		1			
	945	979	-34	5		904	41
	30008	30020	-12	3			
	-	077		1			
	-	187		1			
$^4F_{9/2}$,	30362	30350	12	5		30300	62
$^4L_{19/2}$,	-	381		3			
$^4I_{11/2}$	472	458	14	5			
	459	468	-9	3			

Appendix III. (cont.)

SLJ[a] State	Expt'l.[b] (cm^{-1})	Calc.[c] (cm^{-1})	E-C	2μ	$Pu^{3+}LaCl_3$[d] (cm^{-1})	$PuCl_3$[e] (cm^{-1})	ΔE_N[f]
$^4F_{9/2}$,	30503	30511	-8	5			
$^4L_{19/2}$	-	527		1			
$^4I_{11/2}$	564	556	8	3			
	-	574		1			
	-	607		1			
	596	617	-21	3			
	-	634		1			
	639	639	0	5			
	-	656		5			
	-	676		3			
	-	681		1			
	-	692		3			
	-	785		5			
	-	790		1			
	-	804		5			
	835	827	8	3			
	823	841	-18	5			
$^4F_{7/2}$	31220	31206	14	5			
	213	222	-9	3			

Appendix III. (cont.)

SLJ[a] State	Expt'l.[b] (cm^{-1})	Calc.[c] (cm^{-1})	E-C	2μ	$Pu^{3+}LaCl_3$[d] (cm^{-1})	$PuCl_3$[e] (cm^{-1})	ΔE_N[f]
$^4F_{7/2}$	31225	31230	-5	5			
	-	259		1			
$^4H_{9/2}$	31591	31581	10	5			
	661	674	-13	1			
	682	674	8	3			
	816	786	30	5			
	783	792	-9	3			
$^4H_{13/2}$,	-	32092		5			
$^4P_{5/2}$	-	168		1			
	-	185		3			
	-	226		5			
	-	230		1			
	-	230		3			
	-	272		3			
	-	274		5			
	-	337		1			
	-	345		3			

Appendix III. (cont.)

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[a]The principal SLJ-component of the state is given as a label only since in many cases the state has < 50% of the indicated character. When the crystal-field components in a given energy range belong to several different J-states, those states are listed for the group only. No attempt is made to indicate the percentage of individual crystal-field components.

[b]Experimental data for Pu^{3+}:$LaCl_3$ taken from references 13 and 14. An asterisk indicates a level energy deduced from spectra observed in fluorescence, otherwise the data were obtained in absorption. Values in parentheses are from previously unreported experimental results for Pu^{3+}:$LaCl_3$ or for $PuCl_3$ (reference 14) with an approximate correction, ΔE_N. All values are given in cm^{-1} vacuo.

[c]The energy level parameters derived from fitting the data in Column 2 and used to compute these levels are given in Table 3.

[d]Previously unreported results for Pu^{3+}:$LaCl_3$ single crystal measured at ~4 K. When assignments to $\mu = 1/2$ states are indicated, it was assumed that the observed absorption originated in the first excited crystal-field state of the ground state, and a 13 cm^{-1} correction was added.

[e]Data taken from reference 15 and reported in cm^{-1} vacuo.

[f]ΔE_N = E(Pu^{3+}:$LaCl_3$) (Column 2) - E($PuCl_3$) (Column 7).

Appendix IV.

Experimental and Computed Energy Level Structure for $Am^{3+}:LaCl_3/AmCl_3$

SLJ[a] State	Expt'l.[b] (cm^{-1})	Calc.[c] (cm^{-1})	E-C	μ	$AmCl_3$[d] (cm^{-1})	ΔE_N[e]
$^7F_0$	0	-41	41	0		
$^7F_1$	2737*	2720	17	1		
	2785*	2780	5	0		
$^7F_2$	5294*	5308	-14	1		
	5307	5313	-6	2	5307	0
	5389*	5401	-12	0		
$^3F_3$	(7477)	7481	-4	3	7477	0
	7516*	7494	22	0		
	7554*	7537	17	2	7539	15
	-	7614		3		
	7608*	7633	-25	1		
$^7F_4$	9282	9310	-28	2	9303	-21
	-	9484		1		
	9545	9536	9	2	9531	9
	9535	9538	-3	3		
	-	9644		0		
	9867	9860	7	3	9867	0

Appendix IV. (cont.)

SLJ[a] State	Expt'l.[b] (cm^{-1})	Calc.[c] (cm^{-1})	E-C	μ	$AmCl_3$[d] (cm^{-1})	ΔE_N[e]
$^7F_5$	-	11013		0		
	(11071)	065	-6	2	11071	0
	-	091		1		
	(11247)	248	-1	3	247	0
	-	270		1		
	(11360)	336	24	2	360	0
	-	434		3		
$^7F_6$,	12253	12245	8	3		
$^5D_0$	-	276		0		
	-	285		2		
	12275	307	-32	3		
	307	334	-27	2	12304	3
	351*	344	7	1		
	359*	365	-6	0		
	394*	387	7	1		
	437*	438	-1	0		
	446*	438	8	0		
$^5D_1$	-	17215		1		
	-	242		0		

Appendix IV. (cont.)

SLJ[a] State	Expt'l.[b] (cm^{-1})	Calc.[c] (cm^{-1})	E-C	μ	$AmCl_3$[d] (cm^{-1})	ΔE_N[e]
$^5L_6$	19448*	19426	22	0		
	477*	459	18	1		
	529	534	-6	2		
	543*	551	-8	1		
	-	567		0		
	-	580		0		
	-	598		3		
	630	636	-6	2	19602	28
	699	715	-16	3	669	30
$^5D_2$	21624	21664	-40	2	21583	41
	-	666		0		
	-	695		1		
$^5G_2$	-	21855		1		
	21916	902	14	2	21866	50
	-	978		0		
$^5H_3$	-	22491		2		
	22555	555	0	3	22506	49
		555	0	3		

Appendix IV. (cont.)

SLJ[a] State	Expt'l.[b] (cm^{-1})	Calc.[c] (cm^{-1})	E-C	μ	$AmCl_3$[d] (cm^{-1})	ΔE_N[e]
$^5H_3$	-	22571		0		
	-	619		1		
$^5H_5$,	23222	23239	-17	2	23179	43
$^5H_4$	-	242		3		
	256	266	-10	3	23201	55
	-	290		1		
	-	374		0		
	-	388		3		
	-	393		2		
	-	401		1		
	-	523		0		
	23579	570	9	3	23523	56
	-	614		1		
	622	628	-6	2		
	713	742	-29	2	23668	45
$^5H_7$	-	23993		1		
	-	998		0		
	-	24011		0		
	-	031		1		
	24012	036	-24	2	23968	44

Appendix IV. (cont.)

SLJ[a] State	Expt'l.[b] (cm^{-1})	Calc.[c] (cm^{-1})	E-C	μ	$AmCl_3$[d] (cm^{-1})	ΔE_N[e]
$^5H_7$	-	24046		0		
	-	064		1		
	-	077		3		
	-	080		2		
	-	109		3		
$^5L_6$	-	24729		1		
	-	730		0		
	24734	733	1	3		
	-	736		0		
	-	747		0		
	24753	753	0	2	24715	38
	-	760		1		
	-	762		2		
	-	766		3		
$^5D_3$	25193	25213	-20	2		
	221	253	-32	3	25194	27
	-	257		0		
	-	262		1		
	-	290		3		

Appendix IV. (cont.)

SLJ[a] State	Expt'l.[b] (cm^{-1})	Calc.[c] (cm^{-1})	E-C	μ	$AmCl_3$[d] (cm^{-1})	ΔE_N[e]
$^5G_4$,	26344	26325	19	2	26301	43
$^5L_8$	480	492	-12	3	434	46
	-	498		1		
	553	530	23	2	518	35
	-	541		0		
	629	610	19	2	588	41
	-	646		0		
	-	651		1		
	690	709	-19	3	653	37
	-	760		1		
	-	762		0		
	783	775	8	2	752	31
	-	776		3		
	-	791		1		
	-	808		0		
	861	852	9	2	831	30
	861	855	6	3		
$^5G_2$	27328	27361	-33	2	27300	28
	-	361		1		
	-	406		0		

Appendix IV. (cont.)

SLJ[a] State	Expt'l.[b] (cm^{-1})	Calc.[c] (cm^{-1})	E-C	μ	$AmCl_3$[d] (cm^{-1})	ΔE_N[e]
$^5G_5$	-	27467		3		
	-	519		1		
	27520	536	-16	2	27502	40
	542	560	-18	3		
	-	580		0		
	556	587	-31	2		
	-	600		1		
$^5D_0$	-	27599		0		
$^5G_3$	(27748)	27716	32	3	27708	40
	-	735		1		
	-	855		2		
	-	866		3		
	-	918		0		
$^5L_9$,	-	28212		3		
$^5L_{10}$	-	237		2		
	-	258		1		
	-	264		0		
	-	280		3		

Appendix IV. (cont.)

SLJ[a] State	Expt'l.[b] (cm^{-1})	Calc.[c] (cm^{-1})	E-C	μ	$AmCl_3$[d] (cm^{-1})	ΔE_N[e]
$^5L_9$,	(28300)	28308	-8	2		
$^5L_{10}$	(28300)	311	-11	3	28260	40
	(28300)	315	-15	3		
	-	328		1		
	-	346		2		
	-	355		0		
	(28376)	371	5	2	28336	40
	-	402		0		
	-	403		1		
	-	428		0		
	-	438		1		
	-	452		2		
	-	452		0		
	-	466		1		
	-	498		3		
	(28540)	517	23	2		
	(28540)	519	21	3	28498	42
	(28540)	534	6	3		
	-	588		1		
	-	623		2		
	-	630		0		
	(28702)	630	72	3	28662	40

Appendix IV. (cont.)

SLJ[a] State	Expt'l.[b] (cm^{-1})	Calc.[c] (cm^{-1})	E-C	μ	$AmCl_3$[d] (cm^{-1})	ΔE_N[e]
$^5H_7$	-	28760		2		
	-	780		3		
	-	850		1		
	-	875		3		
	-	885		1		
	-	906		2		
	-	929		0		
	-	941		0		
	-	980		1		
	-	988		0		
$^5H_3$,	-	29218		2		
$^5I_4$,	29244	242	2	3		
$^5I_6$,	-	242		1		
$^5F_1$,	-	339		3		
$^5I_5$,	315	355	-40	2	29274	41
$^5K_5$,	-	364		3		
$^5H_4$	-	409		3		
	-	415		0		
	-	432		1		
	-	460		0		
	-	476		2		

Appendix IV. (cont.)

SLJ[a] State	Expt'l.[b] (cm^{-1})	Calc.[c] (cm^{-1})	E-C	μ	$AmCl_3$[d] (cm^{-1})	ΔE_N[e]
$^5H_3$,	29506	29506	0	2		
$^5I_4$,	-	521		0		
$^5I_6$,	-	544		1		
$^5F_1$,	569	565	4	2		
$^5I_5$,	-	578		1		
$^5K_5$,	-	579		3		
$^5H_4$	-	604		1		
	-	604		0		
	-	609		0		
	601	626	-25	3	29560	41
	-	648		3		
	-	648		2		
	-	659		0		
	-	678		2		
	-	688		3		
	-	704		1		
	-	790		1		
	-	866		0		
	-	879		2		
	-	885		3		
	-	911		1		
	(29918)	917	1	3	29878	40

Appendix IV. (cont.)

SLJ[a] State	Expt'l.[b] (cm^{-1})	Calc.[c] (cm^{-1})	E-C	μ	$AmCl_3$[d] (cm^{-1})	ΔE_N[e]
$^5H_3$,	-	29937		3		
$^5I_4$,	-	956		2		
$^5I_6$,	-	966		1		
$^5F_1$,	-	976		3		
$^5I_5$,	-	30013		2		
$^5K_5$,	-	024		0		
$^5H_4$	-	062		1		
	-	075		0		
	-	079		2		
$^5G_2$	-	31085		1		
	(31173)	138	35	2	31143	30
	-	189		0		
$^5D_4$	-	31663		3		
	31687	665	22	2		
	-	679		1		
	705	687	18	3	31676	29
	-	717		0		
	-	30		2		

Appendix IV. (cont.)

SLJ[a] State	Expt'l.[b] (cm^{-1})	Calc.[c] (cm^{-1})	E-C	μ	$AmCl_3$[d] (cm^{-1})	ΔE_N[e]
$^5H_6$,	-	32043		1		
$^5G_3$	-	063		3		
	-	076		2		
	-	106		1		
	-	119		3		
	-	130		0		
	-	165		0		
	(32201)	202	-1	2	32166	35
	-	229		1		
	-	267		3		
	-	302		0		
	-	311		0		
	-	338		2		
	32481	464	17	3		
$^5G_2$,	-	32541		1		
$^5I_8$,	-	577		0		
$^5K_6$,	-	581		1		
$^5K_7$	-	583		0		
	32588	584	4	2		
	-	606		0		
	-	655		1		

Appendix IV. (cont.)

SLJ[a] State	Expt'l.[b] (cm^{-1})	Calc.[c] (cm^{-1})	E-C	μ	$AmCl_3$[d] (cm^{-1})	ΔE_N[e]
$^5G_2$,	-	32675		2		
$^5I_8$,	32669	697	-28	3		
$^5K_6$,	-	703		2		
$^5K_7$	-	706		3		
	-	744		1		
	-	766		3		
	-	768		0		
	-	776		0		
	-	778		0		
	-	790		2		
	-	802		3		
	-	818		2		
	-	818		1		
	-	884		1		
	(32909)	882	27	2		
	-	887		0	32864	45
	(32909)	923	-14	2		
	-	940		0		
	-	946		1		
	-	957		3		
	-	33001		1		
	-	008		3		

Appendix IV. (cont.)

SLJ[a] State	Expt'l.[b] (cm^{-1})	Calc.[c] (cm^{-1})	E-C	μ	$AmCl_3$[d] (cm^{-1})	ΔE_N[e]
$^5G_2$,	-	33051		0		
$^5I_8$,	-	062		0		
$^5K_6$,	-	064		2		
$^5K_7$	-	093		1		
	-					
$^5K_5$,	-	33352		2		
$^5K_8$	-	354		0		
	33386	367	19	3		
	-	379		1		
	-	404		3		
	-	408		0		
	395	413	-18	2		
	-	418		1		
	-	433		0		
	-	456		1		
	475	457	18	2	33413	62
	-	493		2		
	-	532		0		
	-	543		3		
	-	567		1		
	-	578		1		

Appendix IV. (cont.)

SLJ[a] State	Expt'l.[b] (cm^{-1})	Calc.[c] (cm^{-1})	E-C	μ	$AmCl_3$[d] (cm^{-1})	ΔE_N[e]
$^5K_5$,	-	33582		3		
$^5K_8$	-	608		2		
$^5H_4$,	-	33775		3		
$^5H_3$	-	941		0		
	-	956		1		
	34013	963	50	2		
	-	967		0		
	-	992		3		
	073	34044	29	3	34027	46
	-	076		2		
	-	134		1		
	-	134		3		
	34279	334	-55	2	34260	19
$^5G_6$,	-	34541		1		
$^5F_5$,	-	561		0		
$^5D_1$,	-	561		1		
$^5H_6$	-	589		0		
	(34606)	600	6	2	34556	50
	(34606)	606	0	2		
	-	620		1		

Apprendix IV. (cont.)

SLJ[a] State	Expt'l.[b] (cm^{-1})	Calc.[c] (cm^{-1})	E-C	μ	$AmCl_3$[d] (cm^{-1})	ΔE_N[e]
$^5G_6$,	-	34624		0		
$^5F_5$,	-	629		0		
$^5D_1$,	-	646		3		
$^5H_6$	-	655		3		
	-	744		1		
	-	753		3		
	-	789		2		
	-	811		1		
	(34810)	822	-12	2	34760	50
	-	834		0		
	-	842		3		
	-	844		2		
	-	890		1		
	-	921		3		
	-	932		C		
	-	943		1		
	-	984		0		
	-	993		0		
	-	35018		2		
	(35115)	106	9	3	35065	50

Appendix IV. (cont.)

SLJ[a] State	Expt'l.[b] (cm^{-1})	Calc.[c] (cm^{-1})	E-C	μ	$AmCl_3$[d] (cm^{-1})	ΔE_N[e]
$^3O_{10}$,	-	35218		2		
	-	311		3		
	-	338		1		
	-	350		2		
	-	351		0		
	-	409		1		
	-	412		0		
	-	427		3		
	-	444		2		
	-	511		3		
	-	526		3		
	-	528		2		
	-	572		1		
	-	602		0		
$^3P_1$	-	35827		0		
	-	878		1		
$^5I_7$	-	36272		1		
	-	272		3		
	-	291		2		
		307		3		

Appendix IV. (cont.)

SLJ[a] State	Expt'l.[b] (cm^{-1})	Calc.[c] (cm^{-1})	E-C	μ	$AmCl_3$[d] (cm^{-1})	ΔE_N[e]
$^5I_7$	-	36311		0		
	-	311		1		
	-	318		2		
	-	343		1		
	-	370		0		
	-	372		0		
$^5D_4$,	-	36685		3		
$^5D_5$	-	722		0		
	(36736)	723	13	3	36686	50
	(36736)	725	11	2		
	-	731		1		
	-	778		2		
	-	794		3		
	-	800		2		
	-	819		1		
	-	847		0		
	-	864		3		
	-	866		1		
	-	885		2		

Appendix IV. (cont.)

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[a]The principal SLJ-component of the state is given as a label only since in many cases the state has <50% of the indicated character.

[b]Experimental data for $Am^{3+}:LaCl_3$ taken from references 16-18. An asterisk indicates a level energy deduced from spectra observed in fluorescence, otherwise the data were obtained in absorption. Values in parentheses are from experimental results for $AmCl_3$ with an approximate correction, ΔE_N. All values are given in cm^{-1} vacuo.

[c]The energy level parameters used to compute these levels are given in Table 3.

[d]Data tal en from reference 19 and reported in cm^{-1} vacuo.

[e]$\Delta E_N = E(Am^{3+}:LaCl_3)$ (Column 2) - $E(AmCl_3)$ (Column 6).

Appendix V.

Experimental and Computed Energy Level Structure for $Cm^{3+}:LaCl_3$

SLJ[a] State	Expt'l[b] (cm^{-1})	Calc.[c] (cm^{-1})	E-C	2μ
$^8S_{7/2}$	-	0		7(5)
	-	5.3		5
	-	5.7		1
	-	7.5		3
$^6D_{7/2}$	16808	16773	35	5
	861	854	7	1
	972	17005	-33	5
	-	077		3
$^6D_{5/2}$	-	20098		5
	-	160		1
	-	246		3
$^6I_{7/2}$	21705	21717	-12	5
	722	732	-10	3
	810	812	-2	1
	-	833		5
$^6P_{3/2}$	22315	22356	-41	1
	348	378	-30	3
$^6I_{9/2}$	22885	22875	10	3
	928	943	-15	5
	953	946	7	1
	986	987	-1	3
	23018	23032	-14	5

Appendix V. (cont.)

SLJ[a] State	Expt'l[b] (cm^{-1})	Calc.[c] (cm^{-1})	E-C	2μ
$^6I_{17/2}$,	24990	24998	-8	5
$^6I_{11/2}$	25002	25001	1	3
	013	003	10	1
	018	023	-5	5
	026	017	9	1
	040	021	19	3
	058	040	18	5
	067	041	26	3
	096	048	48	1
	113	086	26	1
	120	114	6	3
	148	128	20	1
	168	185	-17	5
$^6I_{17/2}$,	25211	25200	11	3
$^6I_{11/2}$	221	265	-44	5
$^6D_{9/2}$,	25798	25772	26	5
$^6I_{13/2}$	891	863	28	3
	927	958	-31	3
	951	952	-1	5
	977	26003	-26	1
	26009	030	-21	1
	060	062	-2	3
	068	075	-8	1
	074	089	-15	5
	095	097	-2	1

Appendix V. (cont.)

SLJ[a] State	Expt'l[b] (cm^{-1})	Calc.[c] (cm^{-1})	E-C	2μ
$^6I_{13/2}$	26113	26107	6	5
	-	122		3
$^6I_{15/2}$	26344	26404	-60	1
	405	406	-1	3
	459	458	1	3
	476	465	11	1
	505	478	27	5
	535	509	26	1
	549	538	11	5
	563	546	17	3
$^6D_{7/2}$	28068	28040	28	5
	101	089	12	3
	106	094	12	5
	154	164	-10	1
$^6G_{5/2}$	29673	29655	18	5
	744	720	24	3
	780	770	10	1
$^6D_{1/2}$	-	29908		1
$^6I_{7/2}$	30091	30041	50	5
	172	176	-4	1

Appendix V. (cont.)

SLJ[a] State	Expt'l[b] (cm^{-1})	Calc.[c] (cm^{-1})	E-C	2μ
$^6I_{7/2}$	30214	30223	-9	5
	288	251	37	3
$^6D_{5/2}$	30600	30606	-6	1
	621	610	11	3
	629	615	14	5
$^6D_{3/2}$	30646	30666	-20	3
	-	700		1
$^6G_{11/2}$	30902	30915	-13	3
	31000	960	40	5
$^6G_{11/2}$	-	31067		1
	31095	079	16	5
	-	130		3
	139	145	-6	1
$^6G_{9/2}$	31998	32004	-6	3
	32011	023	-12	5
	032	055	-23	1
	070	088	-18	3
	137	096	41	5
$^6G_{3/2}$	32277	32265	12	3
	294	306	-12	1

Appendix V. (cont.)

SLJ[a] State	Expt'l[b] (cm^{-1})	Calc.[c] (cm^{-1})	E-C	2μ
$^6G_{13/2}$	34013	34028	-15	5
	113	125	-12	3
	126	132	-6	1
	208	224	-16	5
	230	238	-8	1
	-	284		3
	335	338	-3	1
$^4N_{17/2}$,	-	35119		5
$^4G_{11/2}$,	35171	165	6	1
$^6G_{7/2}$,	-	182		3
$^6F_{1/2}$	-	228		1
	-	246		5

SLJ[a] State	Expt'l[b] (cm^{-1})	Calc.[c] (cm^{-1})	E-C	2μ
$^4N_{17/2}$,	-	35289		3
$^4G_{11/2}$,	-	335		5
$^6G_{7/2}$,	-	340		1
$^6F_{1/2}$	-	371		5
	35384	374	10	3
	-	400		3
	-	419		1
	-	444		5
	-	458		1
	491	508	-17	5
	516	517	-1	1
	-	555		3
	-	683		5

Appendix V. (cont.)

SLJ[a] State	Expt'l[b] (cm^{-1})	Calc.[c] (cm^{-1})	E-C	2μ	SLJ[a] State	Expt'l[b] (cm^{-1})	Calc.[c] (cm^{-1})	E-C	2μ
$^4N_{17/2}$,	-	35683		1					
$^4G_{11/2}$,	-	703		3					
$^6G_{7/2}$,									
$^6F_{1/2}$									

[a]The principal SLJ-component of the state is given as a label only since in many cases the state has <50% of the indicated character. When the crystal-field components in a given energy range belong to several different J-states, those states are listed for the groups only. No attempt is made to indicate the parentage of individual crystal-field components.

[b]Experimental values from Ref. 22 (cm^{-1} vacuo).

[c]The energy level parameters used to compute these levels are given in Table 3. All crystal-field levels are classified as $\mu = 1/2$, 3/2, or 5/2 states except the ground state where the predominant $\mu = 7/2$ character is indicated.

Appendix VI.

Experimental and Computed Energy Level Structure for $BkCl_3/Bk^{3+}:LaCl_3$

SLJ[a] State	Expt'l[b] (cm^{-1})	Calc.[c] (cm^{-1})	E-C	μ
$^7F_6$	0	18	-18	0
	-	19		0
	(146)	152	-6	1
	-	165		0
	-	181		1
	(200)	205	-5	2
	(214)	224	-10	3
	(230)	233	-3	2
	-	250		3
$^7F_4$	4289	4278	11	3
	4457	4464	-7	3
	4524*	4476	48	2
	4545*	4527	18	0
	4596*	4568	28	1
	4689	4729	-40	2
$^7F_5$	4954	4923	31	3
	5108	5069	39	2
	5126*	5135	-9	1
	5166	5190	-24	3
	5253	5243	10	2
	-	5269		1
	-	5319		0

Appendix VI. (cont.)

SLJ[a] State	Expt'l[b] (cm^{-1})	Calc.[c] (cm^{-1})	E-C	μ
$^7F_3$,	-	7676		1
$^7F_2$	7720	7727	-7	3
	7720	7743	-23	2
	-	7789		0
	7798	7824	-26	3
	-	7871		0
	8011*	7999	12	2
	8044*	8038	6	1
$^7F_1$	-	9611		0
	-	9683		1
$^7F_0$	-	9903		0

SLJ[a] State	Expt'l[b] (cm^{-1})	Calc.[c] (cm^{-1})	E-C	μ
$^7F_6$,	15402*	15389	13	3
$^7F_4$	440	424	16	3
	495*	480	15	2
	-	543		0
	-	582		0
	-	669		2
	-	691		1
	-	695		0
	706	723	-17	3
	-	741		3
	-	787		1
	788	823	-35	2
	-	902		1

Appendix VI. (cont.)

SLJ[a] State	Expt'l[b] (cm^{-1})	Calc.[c] (cm^{-1})	E-C	μ
$^7F_6$,	15914	15906	8	2
$^7F_4$	-	918		0
$^5D_4$	19530*	19519	11	2
	614	600	14	3
	648*	659	-11	1
	695	675	20	2
	-	762		0
	804	810	-6	3
$^7F_2$	-	20368		0
	-	428		1
	(20444)	449	-5	2

SLJ[a] State	Expt'l[b] (cm^{-1})	Calc.[c] (cm^{-1})	E-C	μ
$^5H_5$,	20788	20787	1	3
$^5H_7$,	-	853		1
$^5L_{10}$	893	885	8	2
	941	938	3	3
	941	943	-2	2
	941	944	-3	3
	-	965		0
	-	985		1
	-	993		1
	-	21002		0
	21016	014	2	2
	-	048		1
	056	049	7	3

Appendix VI. (cont.)

SLJ[a] State	Expt'l[b] (cm^{-1})	Calc.[c] (cm^{-1})	E-C	μ
$^5H_5$,	-	21091		0
$^5H_7$,	-	088		2
$^5L_{10}$	-	132		0
	-	119		1
	-	142		0
	21203	188	15	2
	-	157		1
	-	189		0
	-	209		1
	-	244		3
	-	250		2
	-	276		3
	298	325	-27	3
$^5H_5$,	21298	21328	-30	3
$^5H_7$,	352	340	12	2
$^5L_{10}$	-	364		0
	-	361		1
	462	425	37	2
$^5G_3$	22405*	22410	-5	0
	413*	411	2	3
	445*	445	0	2
	-	446		1
	445*	459	-14	3

Appendix VI. (cont.)

SLJ[a] State	Expt'l[b] (cm^{-1})	Calc.[c] (cm^{-1})	E-C	μ
$^5I_8$	22908	22926	-18	3
	908	928	-20	2
	-	983		1
	23046	23058	-12	2
	-	072		0
	-	127		0
	147	166	-19	3
	-	211		1
	228	224	4	2
	-	325		1
	-	354		0
$^5I_9$,	-	23594		0
$^5I_6$,	-	602		0
$^5G_2$	-	610		1
	23634	628	6	2
	634	648	-14	3
	634	649	-15	3
	-	655		1
	-	665		2
	-	683		3
	746	729	17	3
	746	758	-12	2
	-	798		2
	-	800		1

Appendix VI. (cont.)

SLJ[a] State	Expt'l[b] (cm^{-1})	Calc.[c] (cm^{-1})	E-C	μ
$^5L_9$,	23831	23814	17	3
$^5L_6$,	-	817		0
$^5G_2$	-	827		0
	-	839		1
	900	883	17	3
	900	891	9	2
	-	900		0
	-	994		1
	-	24011		0
	-	102		1
	-	162		0
	24154	156	-2	2

SLJ[a] State	Expt'l[b] (cm^{-1})	Calc.[c] (cm^{-1})	E-C	μ
$^5G_5$	24674*	24709	-35	2
	764*	816	-52	3
	-	834		0
	-	861		1
	-	956		1
	-	25012		2
	25112	050	62	3
$^5I_6$,	-	25983		1
$^7F_0$,	-	984		0
$^5D_3$,	-	26020		0
$^5F_4$	26041	036	5	3
	041	037	4	2

Appendix VI. (cont.)

SLJ[a] State	Expt'l[b] (cm^{-1})	Calc.[c] (cm^{-1})	E-C	μ
$^5I_6$,	-	26046		1
$^7F_0$,	-	055		0
$^5D_3$,	-	132		2
$^5F_4$	-	142		3
	26191	168	23	3
	-	236		1
	-	257		0
	329	330	-1	3
	329	334	-5	2
	-	350		0
	412	405	7	2
	-	566		2
	-	568		1

SLJ[a] State	Expt'l[b] (cm^{-1})	Calc.[c] (cm^{-1})	E-C	μ
$^5I_6$,	-	26571		3
$^7F_0$,	-	582		0
$^5D_3$,	-	632		3
$^5F_4$	-			
$^5L_7$	-	26746		0
	-	789		0
	-	795		1
	26824	828	-4	3
	824	832	-8	2
	-	854		0
	-	886		1
	-	902		1

Appendix VI. (cont.)

SLJ[a] State	Expt'l[b] (cm^{-1})	Calc.[c] (cm^{-1})	E-C	μ
$^5L_7$	26954	26940	14	2
	954	952	2	3
$^3G_5$	-	27471		2
	-	473		3
	-	509		1
	-	526		2
	-	528		0
	-	529		1
	-	543		3
$^5P_2$	-	28118		1
	-	120		0
	-	166		2
$^5H_7$	28547	28536	11	3
	-	545		1
	547	554	-7	2
	-	560		0
	-	568		3
	-	581		1
	-	596		2
	-	607		0

Appendix VI. (cont.)

SLJ[a] State	Expt'l[b] (cm^{-1})	Calc.[c] (cm^{-1})	E-C	μ
$^5H_7$	-	28615		1
	-	629		0
$^5F_1$	-	28818		0
	-	820		1
$^5D_3$,	29090	29131	-41	2
$^5I_4$,	187	191	-4	3
$^5I_8$	-	208		1
	-	237		3
	-	293		0
	-	334		0
	-	354		1
$^5D_3$,	-	29394		2
$^5I_4$,	-	398		3
$^5I_8$	-	405		0
	-	444		2
	-	447		1
	-	468		3
	-	486		0
	-	488		1
	-	489		2
	-	499		0
	29534	500	34	2
	534	529	5	3
	-	548		3

Appendix VI. (cont.)

SLJ[a] State	Expt'l[b] (cm^{-1})	Calc.[c] (cm^{-1})	E-C	μ	SLJ[a] State	Expt'l[b] (cm^{-1})	Calc.[c] (cm^{-1})	E-C	μ
$^5D_3$,	-	29612		1	$^5G_6$	-	29963		2
$^5I_4$,	-	666		2		-	970		1
$^5I_8$						-	974		0
						-	30004		1
$^5G_6$	29914	29905	9	3		-	025		0
	914	909		2		-	027		0
	-	953		3					

[a]The principal SLJ-component of the state is given as a label only since in many cases the state has <50% of the indicated character. When the crystal-field components in a given energy range belong to several different J-states, those states are listed for the group only. No attempt is made to indicate the parentage of individual crystal-field components.

[b]Experimental data for $BkCl_3$ taken from reference 25. An asterisk indicates a level energy deduced from spectra observed in Bk^{3+}:$LaCl_3$ fluorescence,[26,27] otherwise the data were obtained in absorption and in some cases the same level was observed in both fluorescence and absorption. Values in parentheses refer to assignments deduced from comparisons of spectra taken at 298, 77 and 4K. All values are given in cm^{-1} vacuo.

[c]The energy level parameters used to compute these levels are given in Table 3.

Appendix VII.

Experimental and Computed Energy Level Structure for $CfCl_3/Cf^{3+}:LaCl_3$

SLJ[a] State	Expt'l[b] (cm^{-1})	Calc.[c] (cm^{-1})	E-C	2μ
$^6H_{15/2}$	0	-12	12	3
	21*	18	3	1
	-	23		5
	(104)*	112	-8	1
	-	124		3
	171*	175		5
	265*	270	-5	3
	-	334		1
$^6F_{11/2}$,	6299	6278	21	5
$^6F_{9/2}$	-	6291		1
	6347	6368	-21	3
	-	6402		5
$^6F_{11/2}$,	6504	6488	16	1
$^6F_{9/2}$	6504	6517	-13	5
	-	6547		3
	6564	6566	-2	1
	6647	6684	-37	3
	-	6728		5
	-	6839		3
$^6H_{13/2}$	7985	7983	2	1
	8049	8047	2	3
	8075	8084	-9	1
	-	8137		5
	-	8143		1

Appendix VII. (cont.)

SLJ[a] State	Expt'l[b] (cm^{-1})	Calc.[c] (cm^{-1})	E-C	2μ
$^6H_{13/2}$	8161	8159	2	3
	8194	8207	-13	5
$^2H_{11/2}$	(11271)	11243	28	3
	471	465	6	5
	-	476		1
	672	675	-3	3
	-	729		1
	803	830	-27	5
$^6F_{3/2}$	-	12131		1
	-	206		3
$^6H_{9/2}$	12752	12775	-23	3
	-	822		1
	866	864	2	5
	866	866	0	3
	916	963	-47	5
$^6F_{7/2}$	-	13222		3
	13276	250	26	5
	276	252	24	1
	276	258	18	5
$^6H_{7/2}$	14401*	14389	12	5

Appendix VII. (cont.)

SLJ[a] State	Expt'l[b] (cm^{-1})	Calc.[c] (cm^{-1})	E-C	2μ
$^6H_{7/2}$	-	14447		1
	14548	559	-11	5
	612	626	-14	3
$^6F_{5/2}$	-	14815		3
	-	897		5
	14961	982	-21	1
$^6H_{15/2}$,	15876	15875	1	1
$^6F_{5/2}$	978	952	26	1
	16042	16061	-19	3
	093	124	31	5
	179	182	-3	1

SLJ[a] State	Expt'l[b] (cm^{-1})	Calc.[c] (cm^{-1})	E-C	2μ
$^6H_{15/2}$,	-	16274		3
$^6F_{5/2}$	16303	307	-4	5
	303	318	-15	3
	343	342	1	1
	424	393	31	5
	497	448	49	3
$^6F_{1/2}$	-	16818		1
$^4P_{5/2}$	19946*	19942	4	5
	982*	965	17	3
	20033	20013	20	1

Appendix VII. (cont.)

SLJ[a] State	Expt'l[b] (cm^{-1})	Calc.[c] (cm^{-1})	E-C	2μ
$^4K_{17/2}$	20745	20760	-15	3
	-	778		1
	805	799	6	1
	-	834		3
	840	853	-13	5
	-	857		5
	-	872		1
	-	888		3
	915	908	7	5
$^6F_{9/2}$,	21550	21538	12	5
$^6H_{11/2}$	695	698	-3	1
$^4M_{21/2}$,	-	769		3
$^4L_{19/2}$,	-	842		1
$^6P_{7/2}$,	-	873		5
$^6F_{3/2}$	866	879	-13	3
	900	909	-9	5
	-	937		3
	-	939		5
	-	958		1
	21996	22018	-22	3
	-	048		3
	-	054		5

Appendix VII. (cont.)

SLJ[a] State	Expt'l[b] (cm^{-1})	Calc.[c] (cm^{-1})	E-C	2μ
$^6F_{9/2}$,	22122	22092	30	1
$^6H_{11/2}$,	172	180	-8	5
$^4M_{21/2}$,	172	180	-8	1
$^4L_{19/2}$,	-	185		3
$^6P_{7/2}$,	-	222		3
$^6F_{3/2}$	-	222		5
	231	224	7	1
	-	247		5
	266	261	5	3
	-	312		1
	-	343		1
	-	378		5
	400	402	-2	3

SLJ[a] State	Expt'l[b] (cm^{-1})	Calc.[c] (cm^{-1})	E-C	2μ
$^6F_{9/2}$,	-	22461		5
$^6H_{11/2}$,	-	483		3
$^4M_{21/2}$,	-	502		1
$^4L_{19/2}$,	-	545		3
$^6P_{7/2}$,	-	547		5
$^6F_{3/2}$	22587	562	25	1
	633	611	22	5
	-	614		5
	-	629		1
	-	652		3
	710	714	-4	3
	-	720		5

Appendix VII. (cont.)

SLJ[a] State	Expt'l[b] (cm^{-1})	Calc.[c] (cm^{-1})	E-C	2μ
$^4I_{13/2}$	23072	23041	31	1
	131	141	-10	3
	190	197	-7	5
	-	205		1
	244	255	-11	1
	-	282		3
	325	307	18	5
$^4I_{11/2}$	24360*	24381	-21	1
	401	422	-21	3
	-	426		1
	461	493	-32	3
	533	510	23	5
$^4I_{11/2}$	24630	24587	43	5
$^4F_{9/2}$	-	25435		5
	25483	494	-11	3
	-	600		5
	-	613		1
	-	627		3
$^6F_{3/2}$	26838	26853	-15	1
	932	922	10	3

Appendix VII. (cont.)

SLJ[a] State	Expt'l[b] (cm^{-1})	Calc.[c] (cm^{-1})	E-C	2μ
$^6G_{7/2}$,	27389	27401	-12	1
$^4K_{15/2}$,	464	454	10	5
$^4I_{9/2}$	510	493	17	3
	510	494	16	1
	-	517		3
	-	524		5
	-	541		1
	578	576	2	5
	-	616		5
	639	650	-11	5
	639	652	-13	3
	-	680		1
	731	731	0	3

SLJ[a] State	Expt'l[b] (cm^{-1})	Calc.[c] (cm^{-1})	E-C	2μ
$^6G_{7/2}$,	-	27778		3
$^4K_{15/2}$,	-	792		5
$^4I_{9/2}$	-	811		3
	-	884		1
$^4F_{5/2}$	-	28296		1
	-	368		5
	-	467		3

Appendix VII. (cont.)

SLJ[a] State	Expt'l[b] (cm^{-1})	Calc.[c] (cm^{-1})	E-C	2μ
$^4I_{15/2}$,	-	29045		1
$^6F_{7/2}$,	-	053		1
$^4G_{5/2}$,	29078	083	-5	3
$^4H_{11/2}$,	-	114		5
$^4F_{3/2}$,	163	179	-16	1
$^6P_{7/2}$,	163	179	-16	3
$^4H_{13/2}$,	-	189		5
$^6P_{5/2}$	231	223	8	3
	326	338	-12	5
	447	455	-8	1
	447	460	-13	3
	447	464	-17	5
	-	521		3

SLJ[a] State	Expt'l[b] (cm^{-1})	Calc.[c] (cm^{-1})	E-C	2μ
$^4I_{15/2}$,	29542	29558	-16	5
$^6F_{7/2}$,	542	559	-17	1
$^4G_{5/2}$,	-	571		5
$^4H_{11/2}$,	-	583		1
$^4F_{3/2}$,	595	603	-8	3
$^6P_{7/2}$,	-	650		1
$^4H_{13/2}$,	-	710		3
$^6P_{5/2}$	727	719	8	5
	-	868		1
	887	896	-9	3
	-	30120		1
	-	129		3

Appendix VII. (cont.)

SLJ[a] State	Expt'l[b] (cm^{-1})	Calc.[c] (cm^{-1})	E-C	2μ
$^4I_{15/2}$,	-	30156		1
$^6F_{7/2}$,	-	158		3
$^4G_{5/2}$,	-	162		5
$^4H_{11/2}$,	-	209		5
$^4F_{3/2}$,	30230	213	17	5
$^6P_{7/2}$,	230	241	-11	1
$^4H_{13/2}$,	-	250		3
$^6P_{5/2}$	-	280		1
	340	321	19	5
	-	359		1
	-	385		3
	544	518	26	5

SLJ[a] State	Expt'l[b] (cm^{-1})	Calc.[c] (cm^{-1})	E-C	2μ
$^4P_{1/2}$	-	31132		1
$^4M_{17/2}$	-	31363		1
	-	370		1
	-	391		3
	-	398		3
	-	398		5
	31457	448	9	5
	457	454	3	3
	457	460	-3	1
	-	511		5

Appendix VII. (cont.)

SLJ[a] State	Expt'l[b] (cm^{-1})	Calc.[c] (cm^{-1})	E-C	2μ
$^4K_{13/2}$,	32166	32184	-18	1
$^4G_{11/2}$	-	199		5
	-	212		3
	-	216		3
	-	221		1
	-	247		5
	-	251		1
	-	289		1
	-	310		5
	-	326		3
	-	354		3
	-	364		1
	-	382		5
$^4M_{19/2}$	-	32471		5
	-	512		3
	32532	524	8	3
	532	533	-1	1
	532	544	-12	5
	-	563		1
	-	596		3
	-	627		1
	-	636		5
	-	662		5
$^4L_{17/2}$	-	33048		1
	-	077		3

Appendix VII. (cont.)

SLJ[a] State	Expt'l[b] (cm^{-1})	Calc.[c] (cm^{-1})	E-C	2μ
$^4L_{17/2}$	-	33090		1
	-	101		3
	-	105		5
	33147	130	17	1
	147	133	14	3
	147	139	8	5
	-	231		5
$^4G_{9/2}$	-	33373		5
	-	379		3
	-	392		1
	-	420		3
	-	424		5
$^2P_{3/2}$	-	34527		3
	-	564		1

[a]The principle SLJ-component of the state is given as a label only since in many cases the state has < 50% of the indicated character. When the crystal-field components in a given energy range belong to several different J-states, those states are listed for the group only. No attempt is made to indicate the parentage of individual crystal-field components.

[b]Experimental data for $CfCl_3$ from reference 28 and for Cf^{3+}:$LaCl_3$ from references 26 and 27. An asterisk indicates an energy deduced from spectra observed in fluorescence,[26,27] otherwise the data were obtained in absorption. In some cases the same energy was obtained in absorption and fluorescence. Values in parentheses are for bands assigned or confirmed based on observations of temperature dependent transition energies. All values are given in cm^{-1} vacuo.

[c]The energy level parameters used to compute these energies are given in Table 3.

Appendix VIII.

Experimental and Computed Energy Level Structure for $Es^{3+}:LaCl_3$

SLJ[a] State	Expt'l[b] (cm^{-1})	Calc.[c] (cm^{-1})	E-C	μ
$^5I_8$	0	-11	11	1
	20	-4	24	0
	85	82	3	0
	137	125	12	1
	191	175	16	2
	-	209		3
	215	249	-34	0
	335	342	-7	1
	-	389		2
	-	450		2
	455	478	-23	3
$^5F_5$	9639	9586	53	2
	9594	9595	-1	3
	9570	9614	-44	0
	9616	9650	-34	1
	9692	9703	-11	1
	9736	9729	7	2
	9705	9742	-37	3
$^5I_7$	10934	10943	-9	0
	958	971	-13	0
	981	990	-9	1
	11014	11021	-7	2
	077	034	43	1

Appendix VIII. (cont.)

SLJ[a] State	Expt'l[b] (cm^{-1})	Calc.[c] (cm^{-1})	E-C	μ
$^5I_7$	11047	11049	-2	2
	–	067		3
	–	068		3
	092	100	-8	1
	104	109	-5	0
$^3D_2$	11917	11916	1	0
	986	956	30	2
	12016	995	21	1
$^5I_6$	12887	12884	3	1
	941	933	8	2
	965	970	-5	3

SLJ[a] State	Expt'l[b] (cm^{-1})	Calc.[c] (cm^{-1})	E-C	μ
$^5I_6$	13022	13009	13	0
	–	046		1
	045	047	-2	0
	–	061		0
	–	066		3
	–	073		2
$^5F_4$	15919	15908	11	0
	934	967	-33	1
	16055	16058	-3	2
	–	069		3
	–	095		2
	–	116		3

Appendix VIII. (cont.)

SLJ[a] State	Expt'l[b] (cm^{-1})	Calc.[c] (cm^{-1})	E-C	μ
$^5I_4$	-	17498		3
	-	510		3
	-	591		2
	-	630		2
	-	701		1
	-	753		0
$^5I_5$	-	18538		3
	-	629		2
	-	754		3
	-	764		1
	-	798		2
$^5I_5$	-	18832		1
	-	892	3	0
$^3K_8$,	19758	19755	3	3
$^5G_6$	-	758		0
	-	764		2
	-	781		0
	-	790		1
	19802	799	3	2
	839	807	32	0
	-	863		1
	-	882		0
	-	888		3

Appendix VIII. (cont.)

SLJ[a] State	Expt'l[b] (cm^{-1})	Calc.[c] (cm^{-1})	E-C	μ
$^3K_8$,	-	19894		2
$^5G_6$	-	918		2
	-	946		1
	-	957		3
	-	966		0
	-	971		3
	-	20019		0
	-	026		1
	20042	034	8	1
	-	050		2
$^5S_2$	20448	20451	-3	2
	-	473		0
	494	497	-3	1
$^5F_4$	-	20755		3
	-	766		2
	20813	797	16	2
	847	836	11	1
	-	841		3
	-	930		0
$^3F_3$	-	21794		0
	-	815		1

Appendix VIII. (cont.)

SLJ[a] State	Expt'l[b] (cm^{-1})	Calc.[c] (cm^{-1})	E-C	μ
$^3F_3$	–	21857		3
	–	889		3
	–	921		2
$^7F_1$	–	22578		0
	–	604		1
$^5G_5$	–	23177		3
	–	183		2
	–	206		1
	–	231		0
	–	249		1
$^5G_5$	–	23257		3
	–	350		2
$^3F_2$	25084	25092	-8	2
	091	098	-7	0
	133	120	13	1
$^5F_4$, $^3L_9$	–	26052		3
	–	115		0
	–	129		3
	–	130		3
	–	130		1
	–	158		2

Appendix VIII. (cont.)

SLJ[a] State	Expt'l[b] (cm^{-1})	Calc.[c] (cm^{-1})	E-C	μ
$^5D_4$,	-	26166		3
$^3L_9$	-	173		2
	-	187		0
	-	233		3
	-	234		3
	-	246		1
	-	282		2
	-	301		2
	-	353		2
	-	361		1
	-	405		0
	-	407		0
	-	417		1

SLJ[a] State	Expt'l[b] (cm^{-1})	Calc.[c] (cm^{-1})	E-C	μ
$^5G_3$	-	26887		1
	-	905		2
	-	908		3
	-	975		0
	-	997		3
$^3K_7$	-	27136		0
	-	139		3
	-	142		2
	-	145		0
	-	144		1
	-	154		0
	-	161		1

Appendix VIII. (cont.)

SLJ[a] State	Expt'l[b] (cm^{-1})	Calc.[c] (cm^{-1})	E-C	μ
$^3K_7$	-	27162		2
	-	165		1
	-	167		3
$^3H_6$	29287	29285	2	1
	273	309	-36	2

SLJ[a] State	Expt'l[b] (cm^{-1})	Calc.[c] (cm^{-1})	E-C	μ
$^3H_6$	-	29317		3
	-	336		3
	-	366		2
	-	389		0
	-	391		1
	-	409		0
	-	423		0

[a]The principal SLJ-component of the state is given as a label only, since in many cases the state has < 50% of the indicated character. When the crystal-field components in a given energy range belong to several different J-states, those states are listed for the group. No attempt is made to indicate the parentage of individual crystal-field components.

[b]Experimental data for $Es^{3+}:LaCl_3$ observed in fluorescence.[26,27] All values are given in cm^{-1} vacuo.

[c]The energy level parameters used to compute these energies are given in Table 3.

Appendix IX.

Computed Energy Level Structure for $Fm^{3+}:LaCl_3$

SLJ[a] State	$E_{Calc.}$[b] cm^{-1}	2μ
$^4I_{15/2}$	0	5
	104	3
	159	3
	304	1
	361	5
	457	3
	575	1
	693	1
$^4F_{9/2}$	8291	3
	8312	5
	8406	3
$^4F_{9/2}$	8469	1
	8528	5
$^2H_{11/2}$	9950	3
	9961	5
	10002	5
	060	3
	081	1
	115	1
$^2P_{3/2}$	12099	3
	188	1
$^4I_{13/2}$	12993	5
	13058	1
	080	3
	135	1
	160	5
	232	3
	309	1
$^4F_{5/2}$	18453	1
	571	5
	589	3

Appendix IX. (cont.)

SLJ[a] State	$E_{Calc.}$[b] cm^{-1}	2μ
$^4I_{9/2}$	19809	3
	850	1
	850	5
	853	3
	874	5
$^4I_{11/2}$,	21154	5
$^4F_{7/2}$	292	1
	300	3
	327	5
	443	1
	446	3
	648	5

SLJ[a] State	$E_{Calc.}$[b] cm^{-1}	2μ
$^4I_{11/2}$,	21699	3
$^4F_{7/2}$	776	5
	804	1
$^4S_{3/2}$	22998	3
	23036	1
$^4G_{7/2}$	24285	3
	302	5
	395	1
	430	5

SLJ[a] State	$E_{Calc.}$[b] cm^{-1}	2μ
$^4G_{9/2}$	25904	5
	904	3
	907	1
	930	3
	956	5
$^2K_{15/2}$	26401	1
	473	3
	573	5
	626	3
	686	1
	726	5

Appendix IX. (cont.)

SLJ[a] State	$E_{Calc.}$[b] cm^{-1}	2μ	SLJ[a] State	$E_{Calc.}$[b] cm^{-1}	2μ
$^2K_{15/2}$	26765	1	$^4F_{5/2}$	28983	5
	784	3		29000	3
				033	1

[a]The principle SLJ-component of the state is given as a label only since in many cases the state has < 50% of the indicated character. When the crystal-field components in a given energy range belong to several different J-states, those states are listed for the group only. No attempt is made to indicate the parentage of individual crystal-field components.

[b]The energy level parameters used to compute these energies are given in Table 3. Only energies of ≤ 30000 cm^{-1} are tabulated.

Appendix X.

Computed Energy Level Structure for $Nd^{3+}:LaCl_3$

SLJ[a] State	$E_{Calc.}$[b] cm^{-1}	μ
$^3H_6$	0	0
	65	1
	255	2
	304	1
	377	3
	393	0
	404	0
	530	2
	658	3
$^3F_4$	3352	2
	3448	1
	3500	2
$^3F_4$	3522	0
	3589	3
	3812	3
$^1D_2$	11979	1
	12021	2
	302	0
$^3H_5$	15271	0
	354	1
	472	2
	533	1
	550	3
$^3H_5$	603	2
	677	3
$^3H_4$,	18907	0
$^3F_3$	19006	2
	029	1
	037	3
	053	3
	194	2
	264	3
	303	1
	448	0

Appendix X. (cont.)

SLJ[a] State	$E_{Calc.}$[b] cm^{-1}	μ
$^3H_4$,	19468	2
$^3F_3$	556	3
$^3P_0$	27704	0
$^3P_2$	27724	0
	820	2
	28015	1
$^1I_6$	32769	3
	822	3
	847	2
	938	2

SLJ[a] State	$E_{Calc.}$[b] cm^{-1}	μ
$^1I_6$	33010	1
	037	0
	121	1
	370	0
	398	0
$^3H_4$,	33741	1
$^3P_1$	745	0
	756	2
	832	0
	866	1
	903	2

SLJ[a] State	$E_{Calc.}$[b] cm^{-1}	μ
$^3H_4$,	34036	3
$^3P_1$	222	3
$^1D_2$	42746	1
	804	2
	43095	0
$^1S_0$	68433	0

Appendix X. (cont.)

[a]The principle SLJ-component of the state is given as a label only since in many cases the state has < 50% of the indicated character. When the crystal-field components in a given energy range belong to several different J-states, those states are listed for the group only. No attempt is made to indicate the parentage of individual crystal-field components.

[b]The energy level parameters used to compute these energies are given in Table 3.

Appendix XI.

Computed Energy Level Structure for $No^{3+}:LaCl_3$

SLJ[a] State	$E_{Calc.}$[b] (cm^{-1})	2μ
$^2F_{7/2}$	0	5
	96	1
	370	5
	474	3
$^2F_{5/2}$	18005	5
	113	1
	307	3

[a]The principal SLJ-component of the state is given.

[b]The energy level parameters used to compute these energies are given in Table 3.

Appendix XII

Matrix Elements of (Uλ)2 for U^{3+}:$LaCl_3$ with Ground State, J1 = 4.5

J2	LEVEL	(U2)2	(U4)2	(U6)2
5.5	4563	0.0214	0.1059	1.0794
1.5	7075	0.0	0.1066	0.0152
6.5	8307	0.0067	0.0096	0.4976
4.5	9631	0.0544	0.0509	0.4242
2.5	9921	0.2016	0.5856	0.2284
2.5	11220	0.7029	0.1949	0.1717
1.5	11220	0.0	0.0592	0.2584
3.5	11518	0.0392	0.0000	0.4925
7.5	11656	0.0	0.0175	0.0987
3.5	13297	0.0884	0.3028	0.0012
4.5	14694	0.0020	0.0397	0.0090
5.5	15524	0.0028	0.0318	0.0268
1.5	15859	0.0	0.1612	0.0203
6.5	16133	0.0346	0.0001	0.1188
0.5	16438	0.0	0.2209	0.0
4.5	16903	0.0011	0.0663	0.0207
3.5	17012	0.0016	0.0100	0.0136
2.5	17527	0.0000	0.0516	0.0335
7.5	18682	0.0	0.1133	0.0935
1.5	19222	0.0	0.0631	0.0079
5.5	19757	0.0078	0.0342	0.0063
2.5	20356	0.0000	0.0030	0.0003
0.5	21440	0.0	0.0559	0.0
4.5	21531	0.0001	0.0156	0.0000
5.5	21585	0.0134	0.0354	0.0050
3.5	22448	0.0001	0.0006	0.0053
1.5	22810	0.0	0.0052	0.0011
6.5	24588	0.0002	0.0027	0.0040
4.5	24743	0.0002	0.0233	0.0008
7.5	24833	0.0	0.0338	0.0082
2.5	25197	0.0044	0.0013	0.0039
8.5	25558	0.0	0.0025	0.0013

Appendix XII (Continued)
Matrix Elements of (Uλ)2 for U^{3+}:$LaCl_3$ (to 26000 cm^{-1})

J1	LEVEL 1	J2	LEVEL 2	(U2)2	(U4)2	(U6)2
0.5	16438	1.5	7075	0.0512	0.0	0.0
0.5	16438	1.5	11220	0.0227	0.0	0.0
0.5	16438	1.5	15859	0.1912	0.0	0.0
0.5	16438	1.5	19222	0.1205	0.0	0.0
0.5	16438	1.5	22810	0.0008	0.0	0.0
0.5	21440	1.5	7075	0.0123	0.0	0.0
0.5	21440	1.5	11220	0.0002	0.0	0.0
0.5	21440	1.5	15859	0.1101	0.0	0.0
0.5	21440	1.5	19222	0.0140	0.0	0.0
0.5	21440	1.5	22810	0.1438	0.0	0.0
0.5	16438	2.5	9921	0.0040	0.0	0.0
0.5	16438	2.5	11220	0.2708	0.0	0.0
0.5	16438	2.5	17527	0.1265	0.0	0.0
0.5	16438	2.5	20356	0.0011	0.0	0.0
0.5	16438	2.5	25197	0.0101	0.0	0.0
0.5	21440	2.5	9921	0.0046	0.0	0.0
0.5	21440	2.5	11220	0.1513	0.0	0.0
0.5	21440	2.5	17527	0.0164	0.0	0.0
0.5	21440	2.5	20356	0.0688	0.0	0.0
0.5	21440	2.5	25197	0.0000	0.0	0.0
0.5	16438	3.5	11518	0.0	0.0873	0.0
0.5	16438	3.5	13297	0.0	0.0068	0.0
0.5	16438	3.5	17012	0.0	0.0129	0.0
0.5	16438	3.5	22448	0.0	0.1676	0.0
0.5	21440	3.5	11518	0.0	0.0365	0.0
0.5	21440	3.5	13297	0.0	0.0349	0.0
0.5	21440	3.5	17012	0.0	0.0528	0.0
0.5	21440	3.5	22448	0.0	0.0462	0.0
0.5	16438	4.5	300	0.0	0.2209	0.0
0.5	16438	4.5	9631	0.0	0.0096	0.0
0.5	16438	4.5	14694	0.0	0.0112	0.0
0.5	16438	4.5	16903	0.0	0.0003	0.0
0.5	16438	4.5	21531	0.0	0.0141	0.0
0.5	16438	4.5	24743	0.0	0.0083	0.0
0.5	21440	4.5	300	0.0	0.0559	0.0
0.5	21440	4.5	9631	0.0	0.0754	0.0
0.5	21440	4.5	14694	0.0	0.0694	0.0
0.5	21440	4.5	16903	0.0	0.0157	0.0
0.5	21440	4.5	21531	0.0	0.0019	0.0
0.5	21440	4.5	24743	0.0	0.0168	0.0
0.5	16438	5.5	4563	0.0	0.0	0.0000
0.5	16438	5.5	15524	0.0	0.0	0.1183
0.5	16438	5.5	19757	0.0	0.0	0.0078
0.5	16438	5.5	21585	0.0	0.0	0.1886
0.5	21440	5.5	4563	0.0	0.0	0.0254
0.5	21440	5.5	15524	0.0	0.0	0.0006

Appendix XII (Continued)

J1	LEVEL 1	J2	LEVEL 2	(U2)2	(U4)2	(U6)2
0.5	21440	5.5	19757	0.0	0.0	0.1958
0.5	21440	5.5	21585	0.0	0.0	0.0074
0.5	16438	6.5	8307	0.0	0.0	0.0001
0.5	16438	6.5	16133	0.0	0.0	0.1155
0.5	16438	6.5	24588	0.0	0.0	0.0757
0.5	21440	6.5	8307	0.0	0.0	0.0314
0.5	21440	6.5	16133	0.0	0.0	0.1112
0.5	21440	6.5	24588	0.0	0.0	0.0890
1.5	7075	1.5	7075	0.0221	0.0	0.0
1.5	7075	1.5	11220	0.0008	0.0	0.0
1.5	7075	1.5	15859	0.0530	0.0	0.0
1.5	7075	1.5	19222	0.0471	0.0	0.0
1.5	7075	1.5	22810	0.0017	0.0	0.0
1.5	11220	1.5	11220	0.0366	0.0	0.0
1.5	11220	1.5	15859	0.1508	0.0	0.0
1.5	11220	1.5	19222	0.1393	0.0	0.0
1.5	11220	1.5	22810	0.0211	0.0	0.0
1.5	15859	1.5	15859	0.0036	0.0	0.0
1.5	15859	1.5	19222	0.0200	0.0	0.0
1.5	15859	1.5	22810	0.0030	0.0	0.0
1.5	19222	1.5	19222	0.0015	0.0	0.0
1.5	19222	1.5	22810	0.0334	0.0	0.0
1.5	22810	1.5	22810	0.2648	0.0	0.0
1.5	7075	2.5	9921	0.3851	0.0047	0.0
1.5	7075	2.5	11220	0.3275	0.1462	0.0
1.5	7075	2.5	17527	0.1841	0.2329	0.0
1.5	7075	2.5	20356	0.0002	0.0041	0.0
1.5	7075	2.5	25197	0.0116	0.0045	0.0
1.5	11220	2.5	9921	0.0003	0.0357	0.0
1.5	11220	2.5	11220	0.0047	0.0782	0.0
1.5	11220	2.5	17527	0.4006	0.0081	0.0
1.5	11220	2.5	20356	0.0058	0.0007	0.0
1.5	11220	2.5	25197	0.0000	0.0364	0.0
1.5	15859	2.5	9921	0.0510	0.0521	0.0
1.5	15859	2.5	11220	0.0148	0.0039	0.0
1.5	15859	2.5	17527	0.1364	0.0512	0.0
1.5	15859	2.5	20356	0.0090	0.0033	0.0
1.5	15859	2.5	25197	0.2540	0.0966	0.0
1.5	19222	2.5	9921	0.0496	0.1105	0.0
1.5	19222	2.5	11220	0.0773	0.0681	0.0
1.5	19222	2.5	17527	0.0158	0.0074	0.0
1.5	19222	2.5	20356	0.2554	0.0129	0.0
1.5	19222	2.5	25197	0.3951	0.1263	0.0
1.5	22810	2.5	9921	0.0310	0.0170	0.0
1.5	22810	2.5	11220	0.0045	0.0031	0.0
1.5	22810	2.5	17527	0.0004	0.0124	0.0
1.5	22810	2.5	20356	0.0053	0.0358	0.0
1.5	22810	2.5	25197	0.3140	0.0205	0.0
1.5	7075	3.5	11518	0.0030	0.0885	0.0
1.5	7075	3.5	13297	0.0917	0.0170	0.0

Appendix XII (Continued)

J1	LEVEL 1	J2	LEVEL 2	(U2)2	(U4)2	(U6)2
1.5	7075	3.5	17012	0.0153	0.0050	0.0
1.5	7075	3.5	22448	0.0031	0.0436	0.0
1.5	11220	3.5	11518	0.0043	0.0276	0.0
1.5	11220	3.5	13297	0.0553	0.1720	0.0
1.5	11220	3.5	17012	0.0173	0.1477	0.0
1.5	11220	3.5	22448	0.2857	0.0228	0.0
1.5	15859	3.5	11518	0.2254	0.0158	0.0
1.5	15859	3.5	13297	0.1423	0.0284	0.0
1.5	15859	3.5	17012	0.0104	0.0081	0.0
1.5	15859	3.5	22448	0.2267	0.1749	0.0
1.5	19222	3.5	11518	0.2422	0.1069	0.0
1.5	19222	3.5	13297	0.0506	0.0071	0.0
1.5	19222	3.5	17012	0.0055	0.0577	0.0
1.5	19222	3.5	22448	0.0035	0.0895	0.0
1.5	22810	3.5	11518	0.0013	0.0344	0.0
1.5	22810	3.5	13297	0.0078	0.0193	0.0
1.5	22810	3.5	17012	0.2464	0.0278	0.0
1.5	22810	3.5	22448	0.0324	0.0322	0.0
1.5	7075	4.5	300	0.0	0.1066	0.0152
1.5	7075	4.5	9631	0.0	0.0385	0.0421
1.5	7075	4.5	14694	0.0	0.0126	0.1202
1.5	7075	4.5	16903	0.0	0.1055	0.1177
1.5	7075	4.5	21531	0.0	0.0399	0.0135
1.5	7075	4.5	24743	0.0	0.0589	0.0170
1.5	11220	4.5	300	0.0	0.0592	0.2584
1.5	11220	4.5	9631	0.0	0.0008	0.0000
1.5	11220	4.5	14694	0.0	0.0388	0.0272
1.5	11220	4.5	16903	0.0	0.1393	0.0178
1.5	11220	4.5	21531	0.0	0.0171	0.0046
1.5	11220	4.5	24743	0.0	0.0056	0.0042
1.5	15859	4.5	300	0.0	0.1612	0.0203
1.5	15859	4.5	9631	0.0	0.1292	0.0369
1.5	15859	4.5	14694	0.0	0.0408	0.0180
1.5	15859	4.5	16903	0.0	0.0619	0.0526
1.5	15859	4.5	21531	0.0	0.0014	0.0823
1.5	15859	4.5	24743	0.0	0.1100	0.0928
1.5	19222	4.5	300	0.0	0.0631	0.0079
1.5	19222	4.5	9631	0.0	0.0043	0.0297
1.5	19222	4.5	14694	0.0	0.0952	0.0049
1.5	19222	4.5	16903	0.0	0.0000	0.0422
1.5	19222	4.5	21531	0.0	0.0402	0.0292
1.5	19222	4.5	24743	0.0	0.2676	0.0096
1.5	22810	4.5	300	0.0	0.0052	0.0011
1.5	22810	4.5	9631	0.0	0.0205	0.0910
1.5	22810	4.5	14694	0.0	0.0139	0.0855
1.5	22810	4.5	16903	0.0	0.0017	0.0000
1.5	22810	4.5	21531	0.0	0.0070	0.2004
1.5	22810	4.5	24743	0.0	0.0048	0.0464
1.5	7075	5.5	4563	0.0	0.1511	0.3862
1.5	7075	5.5	15524	0.0	0.0073	0.1343

Appendix XII (Continued)

J1	LEVEL 1	J2	LEVEL 2	(U2)2	(U4)2	(U6)2
1.5	7075	5.5	19757	0.0	0.0000	0.1746
1.5	7075	5.5	21585	0.0	0.0029	0.0544
1.5	11220	5.5	4563	0.0	0.0000	0.0440
1.5	11220	5.5	15524	0.0	0.2266	0.0284
1.5	11220	5.5	19757	0.0	0.0670	0.0014
1.5	11220	5.5	21585	0.0	0.0420	0.1252
1.5	15859	5.5	4563	0.0	0.0408	0.1283
1.5	15859	5.5	15524	0.0	0.0134	0.2439
1.5	15859	5.5	19757	0.0	0.0289	0.0439
1.5	15859	5.5	21585	0.0	0.0107	0.0861
1.5	19222	5.5	4563	0.0	0.1624	0.0930
1.5	19222	5.5	15524	0.0	0.0964	0.0104
1.5	19222	5.5	19757	0.0	0.0411	0.0103
1.5	19222	5.5	21585	0.0	0.1529	0.3741
1.5	22810	5.5	4563	0.0	0.1266	0.0011
1.5	22810	5.5	15524	0.0	0.0207	0.0083
1.5	22810	5.5	19757	0.0	0.0007	0.0001
1.5	22810	5.5	21585	0.0	0.1149	0.0180
1.5	7075	6.5	8307	0.0	0.0	0.1200
1.5	7075	6.5	16133	0.0	0.0	0.0183
1.5	7075	6.5	24588	0.0	0.0	0.0002
1.5	11220	6.5	8307	0.0	0.0	0.3542
1.5	11220	6.5	16133	0.0	0.0	0.0339
1.5	11220	6.5	24588	0.0	0.0	0.1440
1.5	15859	6.5	8307	0.0	0.0	0.0004
1.5	15859	6.5	16133	0.0	0.0	0.0207
1.5	15859	6.5	24588	0.0	0.0	0.0016
1.5	19222	6.5	8307	0.0	0.0	0.0501
1.5	19222	6.5	16133	0.0	0.0	0.0426
1.5	19222	6.5	24588	0.0	0.0	0.0202
1.5	22810	6.5	8307	0.0	0.0	0.0166
1.5	22810	6.5	16133	0.0	0.0	0.0356
1.5	22810	6.5	24588	0.0	0.0	0.3630
1.5	7075	7.5	11656	0.0	0.0	0.0947
1.5	7075	7.5	18682	0.0	0.0	0.0914
1.5	7075	7.5	24833	0.0	0.0	0.0088
1.5	11220	7.5	11656	0.0	0.0	0.2296
1.5	11220	7.5	18682	0.0	0.0	0.0018
1.5	11220	7.5	24833	0.0	0.0	0.0034
1.5	15859	7.5	11656	0.0	0.0	0.0393
1.5	15859	7.5	18682	0.0	0.0	0.3297
1.5	15859	7.5	24833	0.0	0.0	0.0134
1.5	19222	7.5	11656	0.0	0.0	0.0001
1.5	19222	7.5	18682	0.0	0.0	0.0511
1.5	19222	7.5	24833	0.0	0.0	0.0924
1.5	22810	7.5	11656	0.0	0.0	0.0216
1.5	22810	7.5	18682	0.0	0.0	0.0520
1.5	22810	7.5	24833	0.0	0.0	0.3165
2.5	9921	2.5	9921	0.0195	0.0047	0.0
2.5	9921	2.5	11220	0.1314	0.0158	0.0

Appendix XII (Continued)

J1	LEVEL 1	J2	LEVEL 2	(U2)2	(U4)2	(U6)2
2.5	9921	2.5	17527	0.2475	0.0254	0.0
2.5	9921	2.5	20356	0.0017	0.0035	0.0
2.5	9921	2.5	25197	0.0459	0.0027	0.0
2.5	11220	2.5	11220	0.2038	0.3666	0.0
2.5	11220	2.5	17527	0.0069	0.0316	0.0
2.5	11220	2.5	20356	0.0037	0.0118	0.0
2.5	11220	2.5	25197	0.0018	0.0023	0.0
2.5	17527	2.5	17527	0.1555	0.1114	0.0
2.5	17527	2.5	20356	0.0074	0.0144	0.0
2.5	17527	2.5	25197	0.0049	0.0347	0.0
2.5	20356	2.5	20356	0.3124	0.0044	0.0
2.5	20356	2.5	25197	0.0363	0.0058	0.0
2.5	25197	2.5	25197	0.0005	0.0203	0.0
2.5	9921	3.5	11518	0.0042	0.0937	0.0764
2.5	9921	3.5	13297	0.3963	0.0025	0.3787
2.5	9921	3.5	17012	0.0168	0.0525	0.0284
2.5	9921	3.5	22448	0.0221	0.2445	0.0378
2.5	11220	3.5	11518	0.0408	0.1312	0.0217
2.5	11220	3.5	13297	0.1853	0.1762	0.0776
2.5	11220	3.5	17012	0.0028	0.0242	0.0011
2.5	11220	3.5	22448	0.0120	0.0436	0.2608
2.5	17527	3.5	11518	0.0183	0.1115	0.0020
2.5	17527	3.5	13297	0.3654	0.0000	0.0082
2.5	17527	3.5	17012	0.0013	0.0090	0.0690
2.5	17527	3.5	22448	0.3397	0.1159	0.0058
2.5	20356	3.5	11518	0.0237	0.0410	0.0679
2.5	20356	3.5	13297	0.0059	0.0019	0.1028
2.5	20356	3.5	17012	0.0055	0.0791	0.0848
2.5	20356	3.5	22448	0.0757	0.0404	0.0000
2.5	25197	3.5	11518	0.0001	0.0442	0.0077
2.5	25197	3.5	13297	0.1005	0.0190	0.1056
2.5	25197	3.5	17012	0.0314	0.0673	0.0000
2.5	25197	3.5	22448	0.0531	0.0517	0.0000
2.5	9921	4.5	300	0.2016	0.5856	0.2284
2.5	9921	4.5	9631	0.0296	0.1149	0.0000
2.5	9921	4.5	14694	0.0299	0.0204	0.0090
2.5	9921	4.5	16903	0.1521	0.1605	0.0548
2.5	9921	4.5	21531	0.0000	0.0000	0.0480
2.5	9921	4.5	24743	0.0004	0.0100	0.0355
2.5	11220	4.5	300	0.7029	0.1949	0.1717
2.5	11220	4.5	9631	0.0127	0.0115	0.0006
2.5	11220	4.5	14694	0.0189	0.0012	0.2899
2.5	11220	4.5	16903	0.0133	0.0159	0.1279
2.5	11220	4.5	21531	0.0002	0.0009	0.0110
2.5	11220	4.5	24743	0.0064	0.0000	0.0039
2.5	17527	4.5	300	0.0000	0.0516	0.0335
2.5	17527	4.5	9631	0.5917	0.4235	0.0150
2.5	17527	4.5	14694	0.0021	0.0697	0.0141
2.5	17527	4.5	16903	0.2489	0.0596	0.1525
2.5	17527	4.5	21531	0.0002	0.0003	0.0022

Appendix XII (Continued)

J1	LEVEL 1	J2	LEVEL 2	(U2)2	(U4)2	(U6)2
2.5	17527	4.5	24743	0.0057	0.0070	0.0508
2.5	20356	4.5	300	0.0000	0.0030	0.0003
2.5	20356	4.5	9631	0.0019	0.1320	0.1078
2.5	20356	4.5	14694	0.0004	0.0405	0.0631
2.5	20356	4.5	16903	0.0837	0.0455	0.0175
2.5	20356	4.5	21531	0.0127	0.2279	0.0228
2.5	20356	4.5	24743	0.0828	0.0046	0.3031
2.5	25197	4.5	300	0.0044	0.0013	0.0039
2.5	25197	4.5	9631	0.1857	0.3298	0.0234
2.5	25197	4.5	14694	0.1444	0.3414	0.0004
2.5	25197	4.5	16903	0.4730	0.1343	0.0501
2.5	25197	4.5	21531	0.0098	0.0116	0.0643
2.5	25197	4.5	24743	0.0656	0.0678	0.0005
2.5	9921	5.5	4563	0.0	0.0291	0.0012
2.5	9921	5.5	15524	0.0	0.0309	0.0195
2.5	9921	5.5	19757	0.0	0.0796	0.0060
2.5	9921	5.5	21585	0.0	0.0020	0.0964
2.5	11220	5.5	4563	0.0	0.3747	0.0973
2.5	11220	5.5	15524	0.0	0.0004	0.1854
2.5	11220	5.5	19757	0.0	0.0006	0.1166
2.5	11220	5.5	21585	0.0	0.0006	0.0241
2.5	17527	5.5	4563	0.0	0.2569	0.0288
2.5	17527	5.5	15524	0.0	0.0020	0.0802
2.5	17527	5.5	19757	0.0	0.0458	0.0812
2.5	17527	5.5	21585	0.0	0.0188	0.0012
2.5	20356	5.5	4563	0.0	0.0198	0.0202
2.5	20356	5.5	15524	0.0	0.1054	0.0134
2.5	20356	5.5	19757	0.0	0.4189	0.0111
2.5	20356	5.5	21585	0.0	0.0805	0.0009
2.5	25197	5.5	4563	0.0	0.0496	0.0001
2.5	25197	5.5	15524	0.0	0.0132	0.0214
2.5	25197	5.5	19757	0.0	0.0092	0.0230
2.5	25197	5.5	21585	0.0	0.0033	0.2860
2.5	9921	6.5	8307	0.0	0.0556	0.3905
2.5	9921	6.5	16133	0.0	0.0417	0.0081
2.5	9921	6.5	24588	0.0	0.0163	0.0045
2.5	11220	6.5	8307	0.0	0.1541	0.0000
2.5	11220	6.5	16133	0.0	0.0000	0.0808
2.5	11220	6.5	24588	0.0	0.0015	0.0100
2.5	17527	6.5	8307	0.0	0.3752	0.0047
2.5	17527	6.5	16133	0.0	0.0032	0.0284
2.5	17527	6.5	24588	0.0	0.1132	0.0038
2.5	20356	6.5	8307	0.0	0.0001	0.0989
2.5	20356	6.5	16133	0.0	0.0132	0.1728
2.5	20356	6.5	24588	0.0	0.1667	0.0829
2.5	25197	6.5	8307	0.0	0.1205	0.0159
2.5	25197	6.5	16133	0.0	0.1417	0.4874
2.5	25197	6.5	24588	0.0	0.0176	0.0414
2.5	9921	7.5	11656	0.0	0.0	0.2920
2.5	9921	7.5	18682	0.0	0.0	0.0228

Appendix XII (Continued)

J1	LEVEL 1	J2	LEVEL 2	(U2)2	(U4)2	(U6)2
2.5	9921	7.5	24833	0.0	0.0	0.0006
2.5	11220	7.5	11656	0.0	0.0	0.0051
2.5	11220	7.5	18682	0.0	0.0	0.0469
2.5	11220	7.5	24833	0.0	0.0	0.0163
2.5	17527	7.5	11656	0.0	0.0	0.0615
2.5	17527	7.5	18682	0.0	0.0	0.1437
2.5	17527	7.5	24833	0.0	0.0	0.0090
2.5	20356	7.5	11656	0.0	0.0	0.0045
2.5	20356	7.5	18682	0.0	0.0	0.1814
2.5	20356	7.5	24833	0.0	0.0	0.3085
2.5	25197	7.5	11656	0.0	0.0	0.0016
2.5	25197	7.5	18682	0.0	0.0	0.3836
2.5	25197	7.5	24833	0.0	0.0	0.0690
2.5	9921	8.5	25558	0.0	0.0	0.0210
2.5	11220	8.5	25558	0.0	0.0	0.0043
2.5	17527	8.5	25558	0.0	0.0	0.1246
2.5	20356	8.5	25558	0.0	0.0	0.1066
2.5	25197	8.5	25558	0.0	0.0	0.0501
3.5	11518	3.5	11518	0.3817	0.0861	0.0124
3.5	11518	3.5	13297	0.0445	0.0315	0.0425
3.5	11518	3.5	17012	0.0263	0.0107	0.0165
3.5	11518	3.5	22448	0.1030	0.3035	0.0376
3.5	13297	3.5	13297	0.1233	0.0360	0.0294
3.5	13297	3.5	17012	0.0001	0.0168	0.0526
3.5	13297	3.5	22448	0.1148	0.0826	0.2260
3.5	17012	3.5	17012	0.3108	0.0614	0.0010
3.5	17012	3.5	22448	0.0352	0.0291	0.0338
3.5	22448	3.5	22448	0.9859	0.0579	0.0016
3.5	11518	4.5	300	0.0392	0.0000	0.4925
3.5	11518	4.5	9631	0.0211	0.0034	0.0027
3.5	11518	4.5	14694	0.2075	0.0640	0.1263
3.5	11518	4.5	16903	0.3336	0.0362	0.1194
3.5	11518	4.5	21531	0.0271	0.0100	0.0297
3.5	11518	4.5	24743	0.0171	0.0869	0.0203
3.5	13297	4.5	300	0.0884	0.3028	0.0012
3.5	13297	4.5	9631	0.0445	0.2849	0.0026
3.5	13297	4.5	14694	0.0007	0.0460	0.1390
3.5	13297	4.5	16903	0.1422	0.3072	0.0724
3.5	13297	4.5	21531	0.0035	0.0208	0.0160
3.5	13297	4.5	24743	0.0037	0.0107	0.0532
3.5	17012	4.5	300	0.0016	0.0100	0.0136
3.5	17012	4.5	9631	0.0195	0.0122	0.4926
3.5	17012	4.5	14694	0.0012	0.0007	0.0150
3.5	17012	4.5	16903	0.1616	0.0060	0.0755
3.5	17012	4.5	21531	0.2199	0.0651	0.0452
3.5	17012	4.5	24743	0.1537	0.1795	0.2085
3.5	22448	4.5	300	0.0001	0.0006	0.0053
3.5	22448	4.5	9631	0.0270	0.0314	0.0176
3.5	22448	4.5	14694	0.6102	0.2071	0.0112
3.5	22448	4.5	16903	0.1712	0.0004	0.1608

Appendix XII (Continued)

J1	LEVEL 1	J2	LEVEL 2	(U2)2	(U4)2	(U6)2
3.5	22448	4.5	21531	0.0387	0.0075	0.0019
3.5	22448	4.5	24743	0.0011	0.0014	0.0013
3.5	11518	5.5	4563	0.0706	0.0695	0.0923
3.5	11518	5.5	15524	0.1709	0.0481	0.3570
3.5	11518	5.5	19757	0.0277	0.0085	0.0673
3.5	11518	5.5	21585	0.0020	0.0001	0.2824
3.5	13297	5.5	4563	0.8224	0.4909	0.1203
3.5	13297	5.5	15524	0.0078	0.0930	0.0309
3.5	13297	5.5	19757	0.0119	0.0981	0.0037
3.5	13297	5.5	21585	0.0349	0.0729	0.0527
3.5	17012	5.5	4563	0.1766	0.0002	0.1584
3.5	17012	5.5	15524	0.0006	0.0148	0.0016
3.5	17012	5.5	19757	0.0001	0.0152	0.7379
3.5	17012	5.5	21585	0.0992	0.0474	0.0028
3.5	22448	5.5	4563	0.0000	0.0384	0.0252
3.5	22448	5.5	15524	0.6002	0.0174	0.0248
3.5	22448	5.5	19757	0.2601	0.0157	0.0058
3.5	22448	5.5	21585	0.2627	0.0001	0.0351
3.5	11518	6.5	8307	0.0	0.5520	0.0069
3.5	11518	6.5	16133	0.0	0.2369	0.0006
3.5	11518	6.5	24588	0.0	0.0161	0.0853
3.5	13297	6.5	8307	0.0	0.0776	0.0545
3.5	13297	6.5	16133	0.0	0.0183	0.0194
3.5	13297	6.5	24588	0.0	0.0003	0.0021
3.5	17012	6.5	8307	0.0	0.0573	0.0174
3.5	17012	6.5	16133	0.0	0.9622	0.0001
3.5	17012	6.5	24588	0.0	0.0105	0.1387
3.5	22448	6.5	8307	0.0	0.2324	0.0565
3.5	22448	6.5	16133	0.0	0.0118	0.0007
3.5	22448	6.5	24588	0.0	0.0017	0.0272
3.5	11518	7.5	11656	0.0	0.1188	0.2313
3.5	11518	7.5	18682	0.0	0.0129	0.2083
3.5	11518	7.5	24833	0.0	0.0163	0.0919
3.5	13297	7.5	11656	0.0	0.0005	0.3586
3.5	13297	7.5	18682	0.0	0.0013	0.0031
3.5	13297	7.5	24833	0.0	0.0236	0.0002
3.5	17012	7.5	11656	0.0	0.0407	0.0950
3.5	17012	7.5	18682	0.0	0.0157	0.0628
3.5	17012	7.5	24833	0.0	0.0810	0.3373
3.5	22448	7.5	11656	0.0	0.8563	0.0421
3.5	22448	7.5	18682	0.0	0.0444	0.0015
3.5	22448	7.5	24833	0.0	0.0067	0.0146
3.5	11518	8.5	25558	0.0	0.0	0.0152
3.5	13297	8.5	25558	0.0	0.0	0.0363
3.5	17012	8.5	25558	0.0	0.0	0.0317
3.5	22448	8.5	25558	0.0	0.0	0.0618
4.5	300	4.5	300	0.0711	0.1069	0.4014
4.5	300	4.5	9631	0.0544	0.0509	0.4242
4.5	300	4.5	14694	0.0020	0.0397	0.0090
4.5	300	4.5	16903	0.0011	0.0663	0.0207

Appendix XII (Continued)

J1	LEVEL 1	J2	LEVEL 2	(U2)2	(U4)2	(U6)2
4.5	300	4.5	21531	0.0001	0.0156	0.0000
4.5	300	4.5	24743	0.0002	0.0233	0.0008
4.5	9631	4.5	9631	0.1379	0.0038	0.1803
4.5	9631	4.5	14694	0.0689	0.0029	0.0015
4.5	9631	4.5	16903	0.0221	0.0623	0.0002
4.5	9631	4.5	21531	0.0000	0.0183	0.0855
4.5	9631	4.5	24743	0.0072	0.1139	0.0019
4.5	14694	4.5	14694	0.0185	0.1208	0.0292
4.5	14694	4.5	16903	0.1877	0.0789	0.0505
4.5	14694	4.5	21531	0.0442	0.1064	0.0604
4.5	14694	4.5	24743	0.0000	0.0945	0.1744
4.5	16903	4.5	16903	0.0014	0.0520	0.0814
4.5	16903	4.5	21531	0.0272	0.0068	0.2324
4.5	16903	4.5	24743	0.0316	0.1185	0.0574
4.5	21531	4.5	21531	0.0006	0.0542	0.0076
4.5	21531	4.5	24743	0.2870	0.0060	0.2124
4.5	24743	4.5	24743	0.0290	0.0068	0.0004
4.5	300	5.5	4563	0.0214	0.1059	1.0794
4.5	300	5.5	15524	0.0028	0.0318	0.0268
4.5	300	5.5	19757	0.0078	0.0342	0.0063
4.5	300	5.5	21585	0.0134	0.0354	0.0050
4.5	9631	5.5	4563	0.0134	0.0004	0.0057
4.5	9631	5.5	15524	0.2325	0.0140	0.3632
4.5	9631	5.5	19757	0.1479	0.1947	0.1386
4.5	9631	5.5	21585	0.0028	0.2374	0.0612
4.5	14694	5.5	4563	0.0000	0.0492	0.3857
4.5	14694	5.5	15524	0.3544	0.1670	0.0328
4.5	14694	5.5	19757	0.3099	0.1181	0.0090
4.5	14694	5.5	21585	0.2680	0.0254	0.0761
4.5	16903	5.5	4563	0.1588	0.3095	0.1620
4.5	16903	5.5	15524	0.0178	0.1362	0.0513
4.5	16903	5.5	19757	0.0184	0.0174	0.1544
4.5	16903	5.5	21585	0.0698	0 4996	0.0625
4.5	21531	5.5	4563	0.0003	0.0215	0.0083
4.5	21531	5.5	15524	0.0028	0.0122	0.3841
4.5	21531	5.5	19757	0.0009	0.1751	0.1424
4.5	21531	5.5	21585	0.5670	0.0289	0.4861
4.5	24743	5.5	4563	0.0002	0.0218	0.0025
4.5	24743	5.5	15524	0.0091	0.0253	0.0094
4.5	24743	5.5	19757	0.2405	0.0249	0.3733
4.5	24743	5.5	21585	0.3043	0.2081	0.0150
4.5	300	6.5	8307	0.0067	0.0096	0.4976
4.5	300	6.5	16133	0.0346	0.0001	0.1188
4.5	300	6.5	24588	0.0002	0.0027	0.0040
4.5	9631	6.5	8307	0.1607	0.0000	0.0855
4.5	9631	6.5	16133	0.0525	0.0207	0.9451
4.5	9631	6.5	24588	0.0203	0.0067	0.1467
4.5	14694	6.5	8307	0.0976	0.2904	0.4605
4.5	14694	6.5	16133	0.0735	0.0028	0.1844
4.5	14694	6.5	24588	0.0011	0.0468	0.0079

Appendix XII (Continued)

J1	LEVEL 1	J2	LEVEL 2	(U2)2	(U4)2	(U6)2
4.5	16903	6.5	8307	1.0199	0.2819	0.0099
4.5	16903	6.5	16133	0.0612	0.0277	0.2161
4.5	16903	6.5	24588	0.0023	0.0203	0.0023
4.5	21531	6.5	8307	0.0303	0.0220	0.1353
4.5	21531	6.5	16133	0.3336	0.0705	0.1177
4.5	21531	6.5	24588	0.0833	0.0379	0.0227
4.5	24743	6.5	8307	0.0044	0.0085	0.0162
4.5	24743	6.5	16133	0.7129	0.0137	0.0644
4.5	24743	6.5	24588	0.0199	0.2883	0.3406
4.5	300	7.5	11656	0.0	0.0175	0.0987
4.5	300	7.5	18682	0.0	0.1133	0.0935
4.5	300	7.5	24833	0.0	0.0338	0.0082
4.5	9631	7.5	11656	0.0	0.6050	0.1127
4.5	9631	7.5	18682	0.0	0.5098	0.3960
4.5	9631	7.5	24833	0.0	0.0038	0.0439
4.5	14694	7.5	11656	0.0	0.2796	0.2723
4.5	14694	7.5	18682	0.0	0.1143	0.4848
4.5	14694	7.5	24833	0.0	0.1348	0.0075
4.5	16903	7.5	11656	0.0	0.1868	0.1723
4.5	16903	7.5	18682	0.0	0.2001	0.0234
4.5	16903	7.5	24833	0.0	0.0486	0.0042
4.5	21531	7.5	11656	0.0	0.0039	0.1779
4.5	21531	7.5	18682	0.0	0.3882	0.0598
4.5	21531	7.5	24833	0.0	0.3898	0.0842
4.5	24743	7.5	11656	0.0	0.0056	0.0018
4.5	24743	7.5	18682	0.0	0.0329	0.1192
4.5	24743	7.5	24833	0.0	0.5894	0.6106
4.5	300	8.5	25558	0.0	0.0025	0.0013
4.5	9631	8.5	25558	0.0	0.0001	0.0785
4.5	14694	8.5	25558	0.0	0.0037	0.1784
4.5	16903	8.5	25558	0.0	0.0413	0.0001
4.5	21531	8.5	25558	0.0	0.0045	0.8632
4.5	24743	8.5	25558	0.0	0.2285	0.0093
5.5	4563	5.5	4563	0.1177	0.0958	0.0554
5.5	4563	5.5	15524	0.0177	0.0475	0.0222
5.5	4563	5.5	19757	0.0000	0.0258	0.0080
5.5	4563	5.5	21585	0.0001	0.0382	0.0380
5.5	15524	5.5	15524	0.0000	0.1039	0.1383
5.5	15524	5.5	19757	0.0281	0.3626	0.0191
5.5	15524	5.5	21585	0.0195	0.0054	0.0018
5.5	19757	5.5	19757	0.0518	0.0394	0.0022
5.5	19757	5.5	21585	0.1672	0.0172	0.0310
5.5	21585	5.5	21585	0.2965	0.6957	0.0464
5.5	4563	6.5	8307	0.0234	0.1504	1.1017
5.5	4563	6.5	16133	0.0043	0.0005	0.1426
5.5	4563	6.5	24588	0.0097	0.0164	0.0102
5.5	15524	6.5	8307	0.0346	0.0752	0.0120
5.5	15524	6.5	16133	0.0068	0.0125	0.3118
5.5	15524	6.5	24588	0.0731	0.2487	0.5654
5.5	19757	6.5	8307	0.1082	0.0441	0.1552

Appendix XII (Continued)

J1	LEVEL 1	J2	LEVEL 2	(U2)2	(U4)2	(U6)2
5.5	19757	6.5	16133	0.0932	0.3205	0.0252
5.5	19757	6.5	24588	0.4899	0.6427	0.0051
5.5	21585	6.5	8307	0.0080	0.2385	0.0973
5.5	21585	6.5	16133	0.2179	0.2654	0.2379
5.5	21585	6.5	24588	0.0003	0.0327	0.3267
5.5	4563	7.5	11656	0.0031	0.0043	0.4472
5.5	4563	7.5	18682	0.0008	0.0004	0.0064
5.5	4563	7.5	24833	0.0082	0.0022	0.0258
5.5	15524	7.5	11656	0.7739	0.2717	0.0018
5.5	15524	7.5	18682	0.0615	0.1455	0.3546
5.5	15524	7.5	24833	0.0006	0.0961	0.6731
5.5	19757	7.5	11656	0.6577	0.2142	0.2550
5.5	19757	7.5	18682	0.0381	0.0581	0.3159
5.5	19757	7.5	24833	0.0215	0.0043	0.4425
5.5	21585	7.5	11656	0.1938	0.2782	0.0280
5.5	21585	7.5	18682	1.1147	0.0146	0.0034
5.5	21585	7.5	24833	0.0832	0.5919	0.1158
5.5	4563	8.5	25558	0.0	0.0580	0.0189
5.5	15524	8.5	25558	0.0	0.4841	0.5986
5.5	19757	8.5	25558	0.0	0.8402	0.1039
5.5	21585	8.5	25558	0.0	0.0322	0.3692
6.5	8307	6.5	8307	0.2150	0.1708	0.1835
6.5	8307	6.5	16133	0.0453	0.0003	0.0412
6.5	8307	6.5	24588	0.0000	0.0356	0.0179
6.5	16133	6.5	16133	1.5014	0.3283	0.0511
6.5	16133	6.5	24588	0.0006	0.3467	0.1806
6.5	24588	6.5	24588	0.6798	0.2341	0.0110
6.5	8307	7.5	11656	0.0128	0.1651	1.1523
6.5	8307	7.5	18682	0.0127	0.0469	0.2762
6.5	8307	7.5	24833	0.0024	0.0527	0.0000
6.5	16133	7.5	11656	0.0018	0.0743	0.1070
6.5	16133	7.5	18682	0.0278	1.5721	0.1345
6.5	16133	7.5	24833	0.1099	0.5240	0.6641
6.5	24588	7.5	11656	0.0509	0.0930	0.1261
6.5	24588	7.5	18682	0.1584	0.2540	0.8231
6.5	24588	7.5	24833	0.0905	0.3473	0.0359
6.5	8307	8.5	25558	0.0111	0.0000	0.0273
6.5	16133	8.5	25558	0.0524	0.0243	0.3151
6.5	24588	8.5	25558	1.4077	1.1571	0.2298
7.5	11656	7.5	11656	0.4100	0.3557	1.4380
7.5	11656	7.5	18682	0.1568	0.0135	0.1407
7.5	11656	7.5	24833	0.0018	0.0366	0.0883
7.5	18682	7.5	18682	2.8878	0.0257	0.1246
7.5	18682	7.5	24833	0.2758	0.1108	0.0749
7.5	24833	7.5	24833	3.2053	0.8054	0.4763
7.5	11656	8.5	25558	0.0100	0.3596	0.2015
7.5	18682	8.5	25558	0.0001	1.0461	0.7060
7.5	24833	8.5	25558	0.2452	0.9031	0.3091
8.5	25558	8.5	25558	5.9873	0.0399	0.2607

Appendix XIII
Matrix Elements of (Uλ)2 for Np^{3+}:$LaCl_3$ with Ground State, J1 = 4.0

J2	LEVEL	(U2)2	(U4)2	(U6)2
5.0	3954	0.0192	0.0946	0.8519
6.0	7231	0.0134	0.0497	0.6973
2.0	8197	0.2275	0.0542	0.0329
1.0	9642	0.0	0.1441	0.0
7.0	9958	0.0	0.0174	0.3030
4.0	10752	0.0215	0.1053	0.1382
3.0	11588	0.0114	0.1459	0.3937
2.0	11853	0.4629	0.3378	0.0016
8.0	12315	0.0	0.0055	0.0903
2.0	12595	0.0025	0.0034	0.3150
3.0	12732	0.1493	0.2141	0.0783
5.0	15070	0.0027	0.0077	0.0216
6.0	15087	0.0150	0.0134	0.0373
4.0	15298	0.0054	0.0025	0.1987
7.0	16285	0.0	0.0232	0.1083
4.0	17600	0.0019	0.0530	0.0562
8.0	17764	0.0	0.0323	0.1033
2.0	18424	0.0141	0.0088	0.0048
5.0	18593	0.0005	0.0002	0.0390
3.0	18655	0.0039	0.0377	0.0004
0.0	19271	0.0	0.1755	0.0
1.0	20033	0.0	0.0163	0.0
2.0	20632	0.0001	0.0078	0.0000
5.0	21077	0.0024	0.0035	0.0357
6.0	21355	0.0000	0.0034	0.0030
4.0	21381	0.0004	0.0106	0.0050
1.0	21457	0.0	0.1843	0.0
3.0	21478	0.0006	0.0288	0.0341
5.0	21809	0.0184	0.0002	0.0001
0.0	21990	0.0	0.0011	0.0
2.0	22595	0.0145	0.0064	0.0001
8.0	22975	0.0	0.0050	0.0003
7.0	23268	0.0	0.0018	0.0054
9.0	23300	0.0	0.0	0.0047
2.0	23505	0.0001	0.0983	0.0181
6.0	23991	0.0007	0.0002	0.0094
4.0	24007	0.0060	0.0018	0.0001
8.0	24476	0.0	0.0081	0.0115
4.0	25385	0.0009	0.0107	0.0014
6.0	25668	0.0023	0.0021	0.0004
3.0	25703	0.0012	0.0184	0.0058
7.0	26017	0.0	0.0031	0.0006
3.0	26828	0.0018	0.0052	0.0034

Appendix XIII (Continued)
Matrix Elements of (Uλ)2 for Np^{3+}:$LaCl_3$ (to 27000 cm^{-1})

J1	LEVEL 1	J2	LEVEL 2	(U2)2	(U4)2	(U6)2
0.0	19271	2.0	8197	0.3577	0.0	0.0
0.0	19271	2.0	11853	0.0228	0.0	0.0
0.0	19271	2.0	12595	0.0162	0.0	0.0
0.0	19271	2.0	18424	0.0023	0.0	0.0
0.0	19271	2.0	20632	0.0054	0.0	0.0
0.0	19271	2.0	22595	0.0084	0.0	0.0
0.0	19271	2.0	23505	0.1144	0.0	0.0
0.0	21990	2.0	8197	0.0000	0.0	0.0
0.0	21990	2.0	11853	0.0047	0.0	0.0
0.0	21990	2.0	12595	0.0011	0.0	0.0
0.0	21990	2.0	18424	0.0091	0.0	0.0
0.0	21990	2.0	20632	0.0258	0.0	0.0
0.0	21990	2.0	22595	0.0073	0.0	0.0
0.0	21990	2.0	23505	0.0142	0.0	0.0
0.0	19271	4.0	191	0.0	0.1755	0.0
0.0	19271	4.0	10752	0.0	0.0747	0.0
0.0	19271	4.0	15298	0.0	0.0584	0.0
0.0	19271	4.0	17600	0.0	0.0003	0.0
0.0	19271	4.0	21381	0.0	0.0328	0.0
0.0	19271	4.0	24007	0.0	0.0150	0.0
0.0	19271	4.0	25385	0.0	0.0196	0.0
0.0	21990	4.0	191	0.0	0.0011	0.0
0.0	21990	4.0	10752	0.0	0.0119	0.0
0.0	21990	4.0	15298	0.0	0.0039	0.0
0.0	21990	4.0	17600	0.0	0.0057	0.0
0.0	21990	4.0	21381	0.0	0.0058	0.0
0.0	21990	4.0	24007	0.0	0.0042	0.0
0.0	21990	4.0	25385	0.0	0.0902	0.0
0.0	19271	6.0	7231	0.0	0.0	0.0128
0.0	19271	6.0	15087	0.0	0.0	0.0002
0.0	19271	6.0	21355	0.0	0.0	0.1050
0.0	19271	6.0	23991	0.0	0.0	0.0203
0.0	19271	6.0	25668	0.0	0.0	0.0085
0.0	21990	6.0	7231	0.0	0.0	0.0327
0.0	21990	6.0	15087	0.0	0.0	0.0751
0.0	21990	6.0	21355	0.0	0.0	0.0049
0.0	21990	6.0	23991	0.0	0.0	0.0038
0.0	21990	6.0	25668	0.0	0.0	0.0871
1.0	9642	1.0	9642	0.0296	0.0	0.0
1.0	9642	1.0	20033	0.0091	0.0	0.0
1.0	9642	1.0	21457	0.1472	0.0	0.0
1.0	20033	1.0	20033	0.0006	0.0	0.0
1.0	20033	1.0	21457	0.0276	0.0	0.0
1.0	21457	1.0	21457	0.1025	0.0	0.0
1.0	9642	2.0	8197	0.0007	0.0	0.0
1.0	9642	2.0	11853	0.2605	0.0	0.0

Appendix XIII (Continued)

J1	LEVEL 1	J2	LEVEL 2	(U2)2	(U4)2	(U6)2
1.0	9642	2.0	12595	0.0005	0.0	0.0
1.0	9642	2.0	18424	0.0097	0.0	0.0
1.0	9642	2.0	20632	0.0191	0.0	0.0
1.0	9642	2.0	22595	0.0024	0.0	0.0
1.0	9642	2.0	23505	0.0719	0.0	0.0
1.0	20033	2.0	8197	0.0003	0.0	0.0
1.0	20033	2.0	11853	0.0834	0.0	0.0
1.0	20033	2.0	12595	0.0103	0.0	0.0
1.0	20033	2.0	18424	0.0004	0.0	0.0
1.0	20033	2.0	20632	0.0018	0.0	0.0
1.0	20033	2.0	22595	0.0575	0.0	0.0
1.0	20033	2.0	23505	0.0811	0.0	0.0
1.0	21457	2.0	8197	0.0106	0.0	0.0
1.0	21457	2.0	11853	0.1610	0.0	0.0
1.0	21457	2.0	12595	0.1828	0.0	0.0
1.0	21457	2.0	18424	0.0047	0.0	0.0
1.0	21457	2.0	20632	0.0035	0.0	0.0
1.0	21457	2.0	22595	0.0049	0.0	0.0
1.0	21457	2.0	23505	0.0841	0.0	0.0
1.0	9642	3.0	11588	0.0334	0.0577	0.0
1.0	9642	3.0	12732	0.1768	0.0362	0.0
1.0	9642	3.0	18655	0.0188	0.0100	0.0
1.0	9642	3.0	21478	0.0150	0.0956	0.0
1.0	9642	3.0	25703	0.0002	0.1521	0.0
1.0	9642	3.0	26828	0.0049	0.0049	0.0
1.0	20033	3.0	11588	0.0029	0.0000	0.0
1.0	20033	3.0	12732	0.0532	0.0099	0.0
1.0	20033	3.0	18655	0.0335	0.0610	0.0
1.0	20033	3.0	21478	0.0265	0.0619	0.0
1.0	20033	3.0	25703	0.0707	0.0078	0.0
1.0	20033	3.0	26828	0.0294	0.1030	0.0
1.0	21457	3.0	11588	0.1694	0.1499	0.0
1.0	21457	3.0	12732	0.3251	0.0012	0.0
1.0	21457	3.0	18655	0.0275	0.0077	0.0
1.0	21457	3.0	21478	0.0245	0.0244	0.0
1.0	21457	3.0	25703	0.0633	0.0272	0.0
1.0	21457	3.0	26828	0.0078	0.0000	0.0
1.0	9642	4.0	191	0.0	0.1441	0.0
1.0	9642	4.0	10752	0.0	0.0093	0.0
1.0	9642	4.0	15298	0.0	0.0674	0.0
1.0	9642	4.0	17600	0.0	0.0392	0.0
1.0	9642	4.0	21381	0.0	0.0281	0.0
1.0	9642	4.0	24007	0.0	0.0004	0.0
1.0	9642	4.0	25385	0.0	0.0180	0.0
1.0	20033	4.0	191	0.0	0.0163	0.0
1.0	20033	4.0	10752	0.0	0.0033	0.0
1.0	20033	4.0	15298	0.0	0.0064	0.0
1.0	20033	4.0	17600	0.0	0.0294	0.0
1.0	20033	4.0	21381	0.0	0.0287	0.0

Appendix XIII (Continued)

J1	LEVEL 1	J2	LEVEL 2	(U2)2	(U4)2	(U6)2
1.0	20033	4.0	24007	0.0	0.0021	0.0
1.0	20033	4.0	25385	0.0	0.0002	0.0
1.0	21457	4.0	191	0.0	0.1843	0.0
1.0	21457	4.0	10752	0.0	0.1071	0.0
1.0	21457	4.0	15298	0.0	0.0719	0.0
1.0	21457	4.0	17600	0.0	0.0000	0.0
1.0	21457	4.0	21381	0.0	0.0517	0.0
1.0	21457	4.0	24007	0.0	0.0414	0.0
1.0	21457	4.0	25385	0.0	0.0119	0.0
1.0	9642	5.0	3954	0.0	0.1423	0.1006
1.0	9642	5.0	15070	0.0	0.0002	0.1683
1.0	9642	5.0	18593	0.0	0.0138	0.0025
1.0	9642	5.0	21077	0.0	0.0029	0.1031
1.0	9642	5.0	21809	0.0	0.0044	0.0410
1.0	20033	5.0	3954	0.0	0.0526	0.0724
1.0	20033	5.0	15070	0.0	0.0000	0.0015
1.0	20033	5.0	18593	0.0	0.0303	0.0029
1.0	20033	5.0	21077	0.0	0.0307	0.0058
1.0	20033	5.0	21809	0.0	0.0959	0.1302
1.0	21457	5.0	3954	0.0	0.1902	0.0045
1.0	21457	5.0	15070	0.0	0.0583	0.0070
1.0	21457	5.0	18593	0.0	0.0206	0.0178
1.0	21457	5.0	21077	0.0	0.0076	0.0360
1.0	21457	5.0	21809	0.0	0.0345	0.0342
1.0	9642	6.0	7231	0.0	0.0	0.2508
1.0	9642	6.0	15087	0.0	0.0	0.0035
1.0	9642	6.0	21355	0.0	0.0	0.0268
1.0	9642	6.0	23991	0.0	0.0	0.0660
1.0	9642	6.0	25668	0.0	0.0	0.0099
1.0	20033	6.0	7231	0.0	0.0	0.0169
1.0	20033	6.0	15087	0.0	0.0	0.0014
1.0	20033	6.0	21355	0.0	0.0	0.1104
1.0	20033	6.0	23991	0.0	0.0	0.0942
1.0	20033	6.0	25668	0.0	0.0	0.0069
1.0	21457	6.0	7231	0.0	0.0	0.0047
1.0	21457	6.0	15087	0.0	0.0	0.0000
1.0	21457	6.0	21355	0.0	0.0	0.1310
1.0	21457	6.0	23991	0.0	0.0	0.0941
1.0	21457	6.0	25668	0.0	0.0	0.0210
1.0	9642	7.0	9958	0.0	0.0	0.0933
1.0	9642	7.0	16285	0.0	0.0	0.0057
1.0	9642	7.0	23268	0.0	0.0	0.0000
1.0	9642	7.0	26017	0.0	0.0	0.0062
1.0	20033	7.0	9958	0.0	0.0	0.0536
1.0	20033	7.0	16285	0.0	0.0	0.1428
1.0	20033	7.0	23268	0.0	0.0	0.0644
1.0	20033	7.0	26017	0.0	0.0	0.0215
1.0	21457	7.0	9958	0.0	0.0	0.0030
1.0	21457	7.0	16285	0.0	0.0	0.0312

Appendix XIII (Continued)

J1	LEVEL 1	J2	LEVEL 2	(U2)2	(U4)2	(U6)2
1.0	21457	7.0	23268	0.0	0.0	0.0053
1.0	21457	7.0	26017	0.0	0.0	0.0109
2.0	8197	2.0	8197	0.2731	0.2519	0.0
2.0	8197	2.0	11853	0.0211	0.0145	0.0
2.0	8197	2.0	12595	0.0221	0.0087	0.0
2.0	8197	2.0	18424	0.0000	0.0053	0.0
2.0	8197	2.0	20632	0.0028	0.0069	0.0
2.0	8197	2.0	22595	0.0000	0.0037	0.0
2.0	8197	2.0	23505	0.0059	0.1004	0.0
2.0	11853	2.0	11853	0.1768	0.0018	0.0
2.0	11853	2.0	12595	0.0285	0.0842	0.0
2.0	11853	2.0	18424	0.0203	0.0105	0.0
2.0	11853	2.0	20632	0.0213	0.0003	0.0
2.0	11853	2.0	22595	0.0216	0.0000	0.0
2.0	11853	2.0	23505	0.1077	0.0482	0.0
2.0	12595	2.0	12595	0.0006	0.0000	0.0
2.0	12595	2.0	18424	0.0000	0.0056	0.0
2.0	12595	2.0	20632	0.0246	0.0008	0.0
2.0	12595	2.0	22595	0.0060	0.0017	0.0
2.0	12595	2.0	23505	0.2938	0.0207	0.0
2.0	18424	2.0	18424	0.1544	0.2685	0.0
2.0	18424	2.0	20632	0.0005	0.0035	0.0
2.0	18424	2.0	22595	0.0442	0.0572	0.0
2.0	18424	2.0	23505	0.0139	0.0136	0.0
2.0	20632	2.0	20632	0.0032	0.0021	0.0
2.0	20632	2.0	22595	0.1288	0.0468	0.0
2.0	20632	2.0	23505	0.0269	0.0095	0.0
2.0	22595	2.0	22595	0.0021	0.0017	0.0
2.0	22595	2.0	23505	0.0005	0.0093	0.0
2.0	23505	2.0	23505	0.0194	0.0225	0.0
2.0	8197	3.0	11588	0.1145	0.0247	0.0
2.0	8197	3.0	12732	0.0264	0.0889	0.0
2.0	8197	3.0	18655	0.0089	0.0101	0.0
2.0	8197	3.0	21478	0.0356	0.0061	0.0
2.0	8197	3.0	25703	0.0254	0.0105	0.0
2.0	8197	3.0	26828	0.0033	0.0002	0.0
2.0	11853	3.0	11588	0.0064	0.0399	0.0
2.0	11853	3.0	12732	0.0309	0.1548	0.0
2.0	11853	3.0	18655	0.0196	0.0000	0.0
2.0	11853	3.0	21478	0.0595	0.0468	0.0
2.0	11853	3.0	25703	0.0508	0.0078	0.0
2.0	11853	3.0	26828	0.0010	0.0000	0.0
2.0	12595	3.0	11588	0.0317	0.0001	0.0
2.0	12595	3.0	12732	0.0340	0.2470	0.0
2.0	12595	3.0	18655	0.0011	0.0444	0.0
2.0	12595	3.0	21478	0.0327	0.0068	0.0
2.0	12595	3.0	25703	0.1134	0.0072	0.0
2.0	12595	3.0	26828	0.0012	0.0016	0.0
2.0	18424	3.0	11588	0.0485	0.0004	0.0

Appendix XIII (Continued)

J1	LEVEL 1	J2	LEVEL 2	(U2)2	(U4)2	(U6)2
2.0	18424	3.0	12732	0.0263	0.0092	0.0
2.0	18424	3.0	18655	0.0371	0.0002	0.0
2.0	18424	3.0	21478	0.0646	0.0141	0.0
2.0	18424	3.0	25703	0.1668	0.0265	0.0
2.0	18424	3.0	26828	0.0032	0.0010	0.0
2.0	20632	3.0	11588	0.0203	0.0001	0.0
2.0	20632	3.0	12732	0.0090	0.0077	0.0
2.0	20632	3.0	18655	0.1007	0.0007	0.0
2.0	20632	3.0	21478	0.0635	0.1480	0.0
2.0	20632	3.0	25703	0.0243	0.0189	0.0
2.0	20632	3.0	26828	0.0014	0.0070	0.0
2.0	22595	3.0	11588	0.0194	0.0117	0.0
2.0	22595	3.0	12732	0.0207	0.0029	0.0
2.0	22595	3.0	18655	0.1126	0.0091	0.0
2.0	22595	3.0	21478	0.0282	0.0900	0.0
2.0	22595	3.0	25703	0.0030	0.0166	0.0
2.0	22595	3.0	26828	0.0575	0.0760	0.0
2.0	23505	3.0	11588	0.0229	0.1128	0.0
2.0	23505	3.0	12732	0.1193	0.0001	0.0
2.0	23505	3.0	18655	0.1118	0.0242	0.0
2.0	23505	3.0	21478	0.1769	0.0423	0.0
2.0	23505	3.0	25703	0.1679	0.0539	0.0
2.0	23505	3.0	26828	0.0010	0.0017	0.0
2.0	8197	4.0	191	0.2275	0.0542	0.0329
2.0	8197	4.0	10752	0.1746	0.0837	0.0036
2.0	8197	4.0	15298	0.0398	0.0033	0.0157
2.0	8197	4.0	17600	0.0520	0.0024	0.0063
2.0	8197	4.0	21381	0.0011	0.0707	0.0359
2.0	8197	4.0	24007	0.0173	0.0928	0.1460
2.0	8197	4.0	25385	0.0037	0.0452	0.0680
2.0	11853	4.0	191	0.4629	0.3379	0.0016
2.0	11853	4.0	10752	0.0589	0.0232	0.1294
2.0	11853	4.0	15298	0.0118	0.2357	0.0373
2.0	11853	4.0	17600	0.0483	0.0625	0.1716
2.0	11853	4.0	21381	0.0020	0.0567	0.2961
2.0	11853	4.0	24007	0.0003	0.0059	0.0035
2.0	11853	4.0	25385	0.0004	0.0107	0.0164
2.0	12595	4.0	191	0.0025	0.0034	0.3150
2.0	12595	4.0	10752	0.0054	0.0401	0.0003
2.0	12595	4.0	15298	0.0015	0.0950	0.0000
2.0	12595	4.0	17600	0.0113	0.1275	0.0134
2.0	12595	4.0	21381	0.3174	0.0077	0.0009
2.0	12595	4.0	24007	0.0275	0.0167	0.0074
2.0	12595	4.0	25385	0.0507	0.0043	0.0048
2.0	18424	4.0	191	0.0141	0.0088	0.0048
2.0	18424	4.0	10752	0.0596	0.0188	0.0002
2.0	18424	4.0	15298	0.0649	0.0051	0.0001
2.0	18424	4.0	17600	0.0787	0.1104	0.0018
2.0	18424	4.0	21381	0.0057	0.0299	0.0003

Appendix XIII (Continued)

J1	LEVEL 1	J2	LEVEL 2	(U2)2	(U4)2	(U6)2
2.0	18424	4.0	24007	0.0051	0.0309	0.0341
2.0	18424	4.0	25385	0.0112	0.0499	0.0413
2.0	20632	4.0	191	0.0001	0.0078	0.0000
2.0	20632	4.0	10752	0.0023	0.0260	0.0588
2.0	20632	4.0	15298	0.0294	0.0192	0.0094
2.0	20632	4.0	17600	0.0314	0.0048	0.0134
2.0	20632	4.0	21381	0.0119	0.0069	0.0142
2.0	20632	4.0	24007	0.0430	0.0043	0.0574
2.0	20632	4.0	25385	0.0129	0.1915	0.2336
2.0	22595	4.0	191	0.0145	0.0064	0.0001
2.0	22595	4.0	10752	0.0936	0.0230	0.0018
2.0	22595	4.0	15298	0.0115	0.0137	0.0025
2.0	22595	4.0	17600	0.1818	0.0002	0.0038
2.0	22595	4.0	21381	0.0260	0.0007	0.0067
2.0	22595	4.0	24007	0.0416	0.0181	0.0933
2.0	22595	4.0	25385	0.0293	0.0003	0.0404
2.0	23505	4.0	191	0.0001	0.0983	0.0181
2.0	23505	4.0	10752	0.0019	0.0015	0.0061
2.0	23505	4.0	15298	0.4685	0.0069	0.0018
2.0	23505	4.0	17600	0.2099	0.0114	0.1103
2.0	23505	4.0	21381	0.0040	0.0498	0.0014
2.0	23505	4.0	24007	0.0126	0.0009	0.0141
2.0	23505	4.0	25385	0.0022	0.0062	0.0014
2.0	8197	5.0	3954	0.0	0.1640	0.2765
2.0	8197	5.0	15070	0.0	0.0046	0.4218
2.0	8197	5.0	18593	0.0	0.0695	0.0035
2.0	8197	5.0	21077	0.0	0.0243	0.0003
2.0	8197	5.0	21809	0.0	0.0224	0.1485
2.0	11853	5.0	3954	0.0	0.0778	0.0100
2.0	11853	5.0	15070	0.0	0.0298	0.0373
2.0	11853	5.0	18593	0.0	0.1570	0.0151
2.0	11853	5.0	21077	0.0	0.0186	0.0458
2.0	11853	5.0	21809	0.0	0.0048	0.0037
2.0	12595	5.0	3954	0.0	0.0009	0.0458
2.0	12595	5.0	15070	0.0	0.0392	0.0009
2.0	12595	5.0	18593	0.0	0.1099	0.0077
2.0	12595	5.0	21077	0.0	0.0361	0.0430
2.0	12595	5.0	21809	0.0	0.0190	0.0411
2.0	18424	5.0	3954	0.0	0.0114	0.2094
2.0	18424	5.0	15070	0.0	0.0156	0.0394
2.0	18424	5.0	18593	0.0	0.0002	0.0534
2.0	18424	5.0	21077	0.0	0.0837	0.1990
2.0	18424	5.0	21809	0.0	0.0593	0.1005
2.0	20632	5.0	3954	0.0	0.0391	0.0108
2.0	20632	5.0	15070	0.0	0.0204	0.0023
2.0	20632	5.0	18593	0.0	0.0132	0.0020
2.0	20632	5.0	21077	0.0	0.0295	0.0326
2.0	20632	5.0	21809	0.0	0.0520	0.0228
2.0	22595	5.0	3954	0.0	0.1087	0.0017

Appendix XIII (Continued)

J1	LEVEL 1	J2	LEVEL 2	(U2)2	(U4)2	(U6)2
2.0	22595	5.0	15070	0.0	0.0000	0.0084
2.0	22595	5.0	18593	0.0	0.0025	0.0002
2.0	22595	5.0	21077	0.0	0.0247	0.0842
2.0	22595	5.0	21809	0.0	0.0326	0.0467
2.0	23505	5.0	3954	0.0	0.1843	0.0033
2.0	23505	5.0	15070	0.0	0.1474	0.0024
2.0	23505	5.0	18593	0.0	0.0954	0.0388
2.0	23505	5.0	21077	0.0	0.0010	0.1556
2.0	23505	5.0	21809	0.0	0.0319	0.0124
2.0	8197	6.0	7231	0.0	0.1700	0.0141
2.0	8197	6.0	15087	0.0	0.0215	0.0065
2.0	8197	6.0	21355	0.0	0.0044	0.1271
2.0	8197	6.0	23991	0.0	0.0011	0.0423
2.0	8197	6.0	25668	0.0	0.0376	0.0017
2.0	11853	6.0	7231	0.0	0.0065	0.1074
2.0	11853	6.0	15087	0.0	0.0025	0.0455
2.0	11853	6.0	21355	0.0	0.0024	0.0002
2.0	11853	6.0	23991	0.0	0.0042	0.0190
2.0	11853	6.0	25668	0.0	0.0047	0.0269
2.0	12595	6.0	7231	0.0	0.0539	0.1012
2.0	12595	6.0	15087	0.0	0.0027	0.0245
2.0	12595	6.0	21355	0.0	0.3003	0.0515
2.0	12595	6.0	23991	0.0	0.0266	0.0999
2.0	12595	6.0	25668	0.0	0.0347	0.0091
2.0	18424	6.0	7231	0.0	0.0848	0.0989
2.0	18424	6.0	15087	0.0	0.0628	0.0182
2.0	18424	6.0	21355	0.0	0.0627	0.0522
2.0	18424	6.0	23991	0.0	0.0001	0.0243
2.0	18424	6.0	25668	0.0	0.1320	0.0079
2.0	20632	6.0	7231	0.0	0.0306	0.0207
2.0	20632	6.0	15087	0.0	0.2924	0.0340
2.0	20632	6.0	21355	0.0	0.0031	0.0377
2.0	20632	6.0	23991	0.0	0.0204	0.1346
2.0	20632	6.0	25668	0.0	0.0084	0.0560
2.0	22595	6.0	7231	0.0	0.0002	0.0630
2.0	22595	6.0	15087	0.0	0.0420	0.1608
2.0	22595	6.0	21355	0.0	0.0124	0.0130
2.0	22595	6.0	23991	0.0	0.0023	0.1195
2.0	22595	6.0	25668	0.0	0.1051	0.0293
2.0	23505	6.0	7231	0.0	0.2891	0.0001
2.0	23505	6.0	15087	0.0	0.0167	0.0127
2.0	23505	6.0	21355	0.0	0.0006	0.1126
2.0	23505	6.0	23991	0.0	0.0018	0.1008
2.0	23505	6.0	25668	0.0	0.0165	0.0073
2.0	8197	7.0	9958	0.0	0.0	0.1075
2.0	8197	7.0	16285	0.0	0.0	0.0114
2.0	8197	7.0	23268	0.0	0.0	0.0000
2.0	8197	7.0	26017	0.0	0.0	0.0000
2.0	11853	7.0	9958	0.0	0.0	0.0660

Appendix XIII (Continued)

J1	LEVEL 1	J2	LEVEL 2	(U2)2	(U4)2	(U6)2
2.0	11853	7.0	16285	0.0	0.0	0.1075
2.0	11853	7.0	23268	0.0	0.0	0.0155
2.0	11853	7.0	26017	0.0	0.0	0.0210
2.0	12595	7.0	9958	0.0	0.0	0.3446
2.0	12595	7.0	16285	0.0	0.0	0.0474
2.0	12595	7.0	23268	0.0	0.0	0.0024
2.0	12595	7.0	26017	0.0	0.0	0.1548
2.0	18424	7.0	9958	0.0	0.0	0.0030
2.0	18424	7.0	16285	0.0	0.0	0.0070
2.0	18424	7.0	23268	0.0	0.0	0.0082
2.0	18424	7.0	26017	0.0	0.0	0.0056
2.0	20632	7.0	9958	0.0	0.0	0.0455
2.0	20632	7.0	16285	0.0	0.0	0.0184
2.0	20632	7.0	23268	0.0	0.0	0.1564
2.0	20632	7.0	26017	0.0	0.0	0.2293
2.0	22595	7.0	9958	0.0	0.0	0.0312
2.0	22595	7.0	16285	0.0	0.0	0.1942
2.0	22595	7.0	23268	0.0	0.0	0.0826
2.0	22595	7.0	26017	0.0	0.0	0.1595
2.0	23505	7.0	9958	0.0	0.0	0.0037
2.0	23505	7.0	16285	0.0	0.0	0.0002
2.0	23505	7.0	23268	0.0	0.0	0.0000
2.0	23505	7.0	26017	0.0	0.0	0.0105
2.0	8197	8.0	12315	0.0	0.0	0.2545
2.0	8197	8.0	17764	0.0	0.0	0.1549
2.0	8197	8.0	22975	0.0	0.0	0.0002
2.0	8197	8.0	24476	0.0	0.0	0.0061
2.0	11853	8.0	12315	0.0	0.0	0.0277
2.0	11853	8.0	17764	0.0	0.0	0.0329
2.0	11853	8.0	22975	0.0	0.0	0.0000
2.0	11853	8.0	24476	0.0	0.0	0.0103
2.0	12595	8.0	12315	0.0	0.0	0.2105
2.0	12595	8.0	17764	0.0	0.0	0.0386
2.0	12595	8.0	22975	0.0	0.0	0.0013
2.0	12595	8.0	24476	0.0	0.0	0.0065
2.0	18424	8.0	12315	0.0	0.0	0.0082
2.0	18424	8.0	17764	0.0	0.0	0.3199
2.0	18424	8.0	22975	0.0	0.0	0.0004
2.0	18424	8.0	24476	0.0	0.0	0.0961
2.0	20632	8.0	12315	0.0	0.0	0.0169
2.0	20632	8.0	17764	0.0	0.0	0.0501
2.0	20632	8.0	22975	0.0	0.0	0.0767
2.0	20632	8.0	24476	0.0	0.0	0.0677
2.0	22595	8.0	12315	0.0	0.0	0.0015
2.0	22595	8.0	17764	0.0	0.0	0.1081
2.0	22595	8.0	22975	0.0	0.0	0.0239
2.0	22595	8.0	24476	0.0	0.0	0.1371
2.0	23505	8.0	12315	0.0	0.0	0.0085
2.0	23505	8.0	17764	0.0	0.0	0.0119

Appendix XIII (Continued)

J1	LEVEL 1	J2	LEVEL 2	(U2)2	(U4)2	(U6)2
2.0	23505	8.0	22975	0.0	0.0	0.0193
2.0	23505	8.0	24476	0.0	0.0	0.0402
3.0	11588	3.0	11588	0.0000	0.0252	0.0318
3.0	11588	3.0	12732	0.4189	0.0793	0.0691
3.0	11588	3.0	18655	0.0038	0.0017	0.0934
3.0	11588	3.0	21478	0.0657	0.0023	0.0229
3.0	11588	3.0	25703	0.1308	0.0172	0.0081
3.0	11588	3.0	26828	0.0002	0.0031	0.0268
3.0	12732	3.0	12732	0.0282	0.0255	0.0103
3.0	12732	3.0	18655	0.0001	0.0001	0.0728
3.0	12732	3.0	21478	0.0406	0.0072	0.0772
3.0	12732	3.0	25703	0.0220	0.0007	0.0492
3.0	12732	3.0	26828	0.0040	0.0044	0.0117
3.0	18655	3.0	18655	0.1657	0.0139	0.0039
3.0	18655	3.0	21478	0.0061	0 0420	0.0014
3.0	18655	3.0	25703	0.0150	0.0108	0.1079
3.0	18655	3.0	26828	0.0305	0.0074	0.0131
3.0	21478	3.0	21478	0.0115	0.0497	0.0011
3.0	21478	3.0	25703	0.0989	0.0882	0.0028
3.0	21478	3.0	26828	0.0122	0.0497	0.0103
3.0	25703	3.0	25703	0.0233	0.0000	0.0012
3.0	25703	3.0	26828	0.0287	0.0609	0.0140
3.0	26828	3.0	26828	0.1933	0.0055	0.0665
3.0	11588	4.0	191	0.0114	0.1459	0.3937
3.0	11588	4.0	10752	0.1178	0.0429	0.0444
3.0	11588	4.0	15298	0.0000	0.0169	0.0190
3.0	11588	4.0	17600	0.1423	0.0485	0.0145
3.0	11588	4.0	21381	0.0889	0.1829	0.0838
3.0	11588	4.0	24007	0.0046	0.0151	0.0163
3.0	11588	4.0	25385	0.0133	0.0131	0.0510
3.0	12732	4.0	191	0.1493	0.2141	0.0783
3.0	12732	4.0	10752	0.0380	0.0001	0.0004
3.0	12732	4.0	15298	0.0535	0.2071	0.0122
3.0	12732	4.0	17600	0.0169	0.0886	0.0841
3.0	12732	4.0	21381	0.0179	0.0011	0.0862
3.0	12732	4.0	24007	0.0009	0.0122	0.0000
3.0	12732	4.0	25385	0.0067	0.0009	0.0117
3.0	18655	4.0	191	0.0039	0.0377	0.0004
3.0	18655	4.0	10752	0.0118	0.0527	0.0385
3.0	18655	4.0	15298	0.0002	0.0026	0.0632
3.0	18655	4.0	17600	0.0953	0.1178	0.0217
3.0	18655	4.0	21381	0.0052	0.0221	0.0026
3.0	18655	4.0	24007	0.0034	0.1046	0.0198
3.0	18655	4.0	25385	0.0008	0.0056	0.2506
3.0	21478	4.0	191	0.0006	0.0288	0.0341
3.0	21478	4.0	10752	0.1185	0.0046	0.1328
3.0	21478	4.0	15298	0.0201	0.0195	0.0074
3.0	21478	4.0	17600	0.0664	0.0167	0.0062
3.0	21478	4.0	21381	0.4246	0.0123	0.0027

Appendix XIII (Continued)

J1	LEVEL 1	J2	LEVEL 2	(U2)2	(U4)2	(U6)2
3.0	21478	4.0	24007	0.0076	0.0178	0.0656
3.0	21478	4.0	25385	0.0089	0.1643	0.0032
3.0	25703	4.0	191	0.0012	0.0184	0.0058
3.0	25703	4.0	10752	0.0630	0.0111	0.0175
3.0	25703	4.0	15298	0.0077	0.0732	0.0057
3.0	25703	4.0	17600	0.0804	0.0001	0.1643
3.0	25703	4.0	21381	0.1129	0.0277	0.0008
3.0	25703	4.0	24007	0.0197	0.0001	0.1435
3.0	25703	4.0	25385	0.0816	0.0030	0.0265
3.0	26828	4.0	191	0.0018	0.0052	0.0034
3.0	26828	4.0	10752	0.0018	0.0042	0.0331
3.0	26828	4.0	15298	0.0003	0.0008	0.0868
3.0	26828	4.0	17600	0.0334	0.0000	0.0654
3.0	26828	4.0	21381	0.0025	0.1016	0.0758
3.0	26828	4.0	24007	0.1280	0.0046	0.0169
3.0	26828	4.0	25385	0.3449	0.0584	0.0016
3.0	11588	5.0	3954	0.0000	0.1904	0.0143
3.0	11588	5.0	15070	0.1907	0.0026	0.0079
3.0	11588	5.0	18593	0.1482	0.2549	0.1012
3.0	11588	5.0	21077	0.0338	0.0085	0.0024
3.0	11588	5.0	21809	0.0013	0.0157	0.0119
3.0	12732	5.0	3954	0.6516	0.0002	0.0006
3.0	12732	5.0	15070	0.0024	0.0685	0.2981
3.0	12732	5.0	18593	0.0084	0.1259	0.0008
3.0	12732	5.0	21077	0.0247	0.0125	0.0666
3.0	12732	5.0	21809	0.0053	0.0030	0.1262
3.0	18655	5.0	3954	0.1965	0.0965	0.0547
3.0	18655	5.0	15070	0.0000	0.0104	0.0111
3.0	18655	5.0	18593	0.0019	0.0281	0.0003
3.0	18655	5.0	21077	0.0813	0.1680	0.0387
3.0	18655	5.0	21809	0.0435	0.0620	0.1535
3.0	21478	5.0	3954	0.0113	0.0331	0.0000
3.0	21478	5.0	15070	0.0377	0.0763	0.0414
3.0	21478	5.0	18593	0.3963	0.0578	0.0429
3.0	21478	5.0	21077	0.0000	0.0043	0.0033
3.0	21478	5.0	21809	0.0080	0.0068	0.0068
3.0	25703	5.0	3954	0.0000	0.0562	0.0203
3.0	25703	5.0	15070	0.0038	0.0419	0.0032
3.0	25703	5.0	18593	0.3574	0.1578	0.0256
3.0	25703	5.0	21077	0.2807	0.0251	0.0658
3.0	25703	5.0	21809	0.0352	0.0320	0.0544
3.0	26828	5.0	3954	0.0026	0.0008	0.0009
3.0	26828	5.0	15070	0.0434	0.0233	0.0011
3.0	26828	5.0	18593	0.0613	0.0028	0.0250
3.0	26828	5.0	21077	0.0674	0.0590	0.0012
3.0	26828	5.0	21809	0.0013	0.0018	0.0433
3.0	11588	6.0	7231	0.0	0.0260	0.1161
3.0	11588	6.0	15087	0.0	0.0419	0.0285
3.0	11588	6.0	21355	0.0	0.0922	0.1571

Appendix XIII (Continued)

J1	LEVEL 1	J2	LEVEL 2	(U2)2	(U4)2	(U6)2
3.0	11588	6.0	23991	0.0	0.0016	0.0182
3.0	11588	6.0	25668	0.0	0.0005	0.0867
3.0	12732	6.0	7231	0.0	0.3738	0.0791
3.0	12732	6.0	15087	0.0	0.0045	0.0017
3.0	12732	6.0	21355	0.0	0.0219	0.1449
3.0	12732	6.0	23991	0.0	0.0088	0.0429
3.0	12732	6.0	25668	0.0	0.0203	0.0011
3.0	18655	6.0	7231	0.0	0.0102	0.0335
3.0	18655	6.0	15087	0.0	0.0320	0.0355
3.0	18655	6.0	21355	0.0	0.0110	0.0069
3.0	18655	6.0	23991	0.0	0.0175	0.0663
3.0	18655	6.0	25668	0.0	0.0109	0.1082
3.0	21478	6.0	7231	0.0	0.0443	0.0524
3.0	21478	6.0	15087	0.0	0.0001	0.0774
3.0	21478	6.0	21355	0.0	0.0271	0.0727
3.0	21478	6.0	23991	0.0	0.0270	0.0037
3.0	21478	6.0	25668	0.0	0.1700	0.0077
3.0	25703	6.0	7231	0.0	0.1821	0.0337
3.0	25703	6.0	15087	0.0	0.0003	0.0075
3.0	25703	6.0	21355	0.0	0.0099	0.0632
3.0	25703	6.0	23991	0.0	0.0138	0.0041
3.0	25703	6.0	25668	0.0	0.1575	0.0146
3.0	26828	6.0	7231	0.0	0.0382	0.0061
3.0	26828	6.0	15087	0.0	0.0891	0.2167
3.0	26828	6.0	21355	0.0	0.0046	0.0008
3.0	26828	6.0	23991	0.0	0.0277	0.2132
3.0	26828	6.0	25668	0.0	0.0000	0.0615
3.0	11588	7.0	9958	0.0	0.2546	0.1905
3.0	11588	7.0	16285	0.0	0.0172	0.0501
3.0	11588	7.0	23268	0.0	0.0020	0.0054
3.0	11588	7.0	26017	0.0	0.0133	0.0030
3.0	12732	7.0	9958	0.0	0.0310	0.0384
3.0	12732	7.0	16285	0.0	0.0928	0.0008
3.0	12732	7.0	23268	0.0	0.0215	0.0084
3.0	12732	7.0	26017	0.0	0.0193	0.0003
3.0	18655	7.0	9958	0.0	0.0073	0.0226
3.0	18655	7.0	16285	0.0	0.2062	0.0058
3.0	18655	7.0	23268	0.0	0.0809	0.2749
3.0	18655	7.0	26017	0.0	0.0084	0.0481
3.0	21478	7.0	9958	0.0	0.3074	0.0611
3.0	21478	7.0	16285	0.0	0.0243	0.0706
3.0	21478	7.0	23268	0.0	0.0079	0.0282
3.0	21478	7.0	26017	0.0	0.0412	0.0006
3.0	25703	7.0	9958	0.0	0.2977	0.0300
3.0	25703	7.0	16285	0.0	0.0008	0.0390
3.0	25703	7.0	23268	0.0	0.0000	0.0234
3.0	25703	7.0	26017	0.0	0.0023	0.0008
3.0	26828	7.0	9958	0.0	0.0003	0.0024
3.0	26828	7.0	16285	0.0	0.2154	0.0506

Appendix XIII (Continued)

J1	LEVEL 1	J2	LEVEL 2	(U2)2	(U4)2	(U6)2
3.0	26828	7.0	23268	0.0	0.2047	0.0328
3.0	26828	7.0	26017	0.0	0.0360	0.0008
3.0	11588	8.0	12315	0.0	0.0	0.2165
3.0	11588	8.0	17764	0.0	0.0	0.2219
3.0	11588	8.0	22975	0.0	0.0	0.0063
3.0	11588	8.0	24476	0.0	0.0	0.0715
3.0	12732	8.0	12315	0.0	0.0	0.0189
3.0	12732	8.0	17764	0.0	0.0	0.0581
3.0	12732	8.0	22975	0.0	0.0	0.0136
3.0	12732	8.0	24476	0.0	0.0	0.0288
3.0	18655	8.0	12315	0.0	0.0	0.0787
3.0	18655	8.0	17764	0.0	0.0	0.0997
3.0	18655	8.0	22975	0.0	0.0	0.0602
3.0	18655	8.0	24476	0.0	0.0	0.2758
3.0	21478	8.0	12315	0.0	0.0	0.0341
3.0	21478	8.0	17764	0.0	0.0	0.0003
3.0	21478	8.0	22975	0.0	0.0	0.0160
3.0	21478	8.0	24476	0.0	0.0	0.0312
3.0	25703	8.0	12315	0.0	0.0	0.0007
3.0	25703	8.0	17764	0.0	0.0	0.0684
3.0	25703	8.0	22975	0.0	0.0	0.0061
3.0	25703	8.0	24476	0.0	0.0	0.0596
3.0	26828	8.0	12315	0.0	0.0	0.0171
3.0	26828	8.0	17764	0.0	0.0	0.0106
3.0	26828	8.0	22975	0.0	0.0	0.0580
3.0	26828	8.0	24476	0.0	0.0	0.0939
3.0	11588	9.0	23300	0.0	0.0	0.0402
3.0	12732	9.0	23300	0.0	0.0	0.1453
3.0	18655	9.0	23300	0.0	0.0	0.0070
3.0	21478	9.0	23300	0.0	0.0	0.0357
3.0	25703	9.0	23300	0.0	0.0	0.0996
3.0	26828	9.0	23300	0.0	0.0	0.4514
4.0	191	4.0	191	0.1575	0.2102	0.2470
4.0	191	4.0	10752	0.0215	0.1053	0.1382
4.0	191	4.0	15298	0.0054	0.0026	0.1987
4.0	191	4.0	17600	0.0019	0.0530	0.0562
4.0	191	4.0	21381	0.0004	0.0106	0.0050
4.0	191	4.0	24007	0.0060	0.0018	0.0001
4.0	191	4.0	25385	0.0009	0.0107	0.0014
4.0	10752	4.0	10752	0.3954	0.4120	0.0474
4.0	10752	4.0	15298	0.0190	0.0164	0.0795
4.0	10752	4.0	17600	0.0020	0.0308	0.0400
4.0	10752	4.0	21381	0.1179	0.0511	0.0640
4.0	10752	4.0	24007	0.0696	0.0238	0.0272
4.0	10752	4.0	25385	0.0482	0.0175	0.0110
4.0	15298	4.0	15298	0.3905	0.0577	0.0506
4.0	15298	4.0	17600	0.2959	0.0975	0.0052
4.0	15298	4.0	21381	0.0139	0.0847	0.0004
4.0	15298	4.0	24007	0.0022	0.0165	0.0007

Appendix XIII (Continued)

J1	LEVEL 1	J2	LEVEL 2	(U2)2	(U4)2	(U6)2
4.0	15298	4.0	25385	0.0115	0.0057	0.0118
4.0	17600	4.0	17600	0.1001	0.1997	0.0542
4.0	17600	4.0	21381	0.0047	0.0000	0.0035
4.0	17600	4.0	24007	0.0025	0.0484	0.1489
4.0	17600	4.0	25385	0.0001	0.0046	0.0016
4.0	21381	4.0	21381	0.3212	0.0070	0.0191
4.0	21381	4.0	24007	0.0043	0.0309	0.0336
4.0	21381	4.0	25385	0.0103	0.0086	0.0042
4.0	24007	4.0	24007	0.0064	0.0283	0.1119
4.0	24007	4.0	25385	0.0964	0.0311	0.0487
4.0	25385	4.0	25385	0.0018	0.0286	0.0196
4.0	191	5.0	3954	0.0192	0.0946	0.8519
4.0	191	5.0	15070	0.0027	0.0077	0.0216
4.0	191	5.0	18593	0.0005	0.0002	0.0390
4.0	191	5.0	21077	0.0024	0.0035	0.0357
4.0	191	5.0	21809	0.0184	0.0002	0.0001
4.0	10752	5.0	3954	0.0687	0.2175	0.0004
4.0	10752	5.0	15070	0.1339	0.0022	0.1166
4.0	10752	5.0	18593	0.0494	0.1343	0.0466
4.0	10752	5.0	21077	0.0367	0.0090	0.0164
4.0	10752	5.0	21809	0.0131	0.0019	0.0375
4.0	15298	5.0	3954	0.0252	0.0014	0.4982
4.0	15298	5.0	15070	0.2569	0.0195	0.0359
4.0	15298	5.0	18593	0.0421	0.0009	0.1411
4.0	15298	5.0	21077	0.2597	0.0866	0.0368
4.0	15298	5.0	21809	0.0181	0.0000	0.0782
4.0	17600	5.0	3954	0.1580	0.2702	0.0153
4.0	17600	5.0	15070	0.0064	0.0022	0.0737
4.0	17600	5.0	18593	0.0159	0.2440	0.0459
4.0	17600	5.0	21077	0.0123	0.0535	0.0194
4.0	17600	5.0	21809	0.0452	0.0079	0.0295
4.0	21381	5.0	3954	0.0020	0.0243	0.0174
4.0	21381	5.0	15070	0.3044	0.1400	0.0072
4.0	21381	5.0	18593	0.0126	0.0335	0.0131
4.0	21381	5.0	21077	0.0009	0.0376	0.0102
4.0	21381	5.0	21809	0.0060	0.1629	0.0116
4.0	24007	5.0	3954	0.0005	0.0074	0.0176
4.0	24007	5.0	15070	0.1110	0.0958	0.0356
4.0	24007	5.0	18593	0.0023	0.0105	0.0013
4.0	24007	5.0	21077	0.0573	0.2008	0.1232
4.0	24007	5.0	21809	0.1485	0.0025	0.1812
4.0	25385	5.0	3954	0.0002	0.0150	0.0010
4.0	25385	5.0	15070	0.1385	0.0012	0.0026
4.0	25385	5.0	18593	0.0021	0.0180	0.0328
4.0	25385	5.0	21077	0.0189	0.0027	0.0023
4.0	25385	5.0	21809	0.0021	0.0905	0.0142
4.0	191	6.0	7231	0.0134	0.0497	0.6973
4.0	191	6.0	15087	0.0150	0.0134	0.0373
4.0	191	6.0	21355	0.0000	0.0034	0.0030

Appendix XIII (Continued)

J1	LEVEL 1	J2	LEVEL 2	(U2)2	(U4)2	(U6)2
4.0	191	6.0	23991	0.0007	0.0002	0.0094
4.0	191	6.0	25668	0.0023	0.0021	0.0004
4.0	10752	6.0	7231	0.1627	0.0800	0.0936
4.0	10752	6.0	15087	0.0119	0.0035	0.2938
4.0	10752	6.0	21355	0.0137	0.2446	0.0153
4.0	10752	6.0	23991	0.0096	0.0019	0.0210
4.0	10752	6.0	25668	0.0705	0.0972	0.2068
4.0	15298	6.0	7231	0.1877	0.1030	0.0733
4.0	15298	6.0	15087	0.0021	0.0502	0.0507
4.0	15298	6.0	21355	0.2264	0.0406	0.2767
4.0	15298	6.0	23991	0.0148	0.0080	0.0235
4.0	15298	6.0	25668	0.0006	0.0001	0.0000
4.0	17600	6.0	7231	0.5884	0.0468	0.0335
4.0	17600	6.0	15087	0.0940	0.0635	0.2726
4.0	17600	6.0	21355	0.0017	0.1191	0.0856
4.0	17600	6.0	23991	0.0000	0.0331	0.0173
4.0	17600	6.0	25668	0.0053	0.0032	0.0444
4.0	21381	6.0	7231	0.0214	0.0536	0.0002
4.0	21381	6.0	15087	0.0001	0.0026	0.0027
4.0	21381	6.0	21355	0.7233	0.0519	0.0159
4.0	21381	6.0	23991	0.0003	0.1540	0.0133
4.0	21381	6.0	25668	0.0642	0.0276	0.0056
4.0	24007	6.0	7231	0.0347	0.0427	0.0305
4.0	24007	6.0	15087	0.0073	0.0614	0.1791
4.0	24007	6.0	21355	0.0904	0.0008	0.0014
4.0	24007	6.0	23991	0.0000	0.0285	0.0203
4.0	24007	6.0	25668	0.0317	0.0181	0.0159
4.0	25385	6.0	7231	0.0597	0.0312	0.0002
4.0	25385	6.0	15087	0.0007	0.0037	0.2158
4.0	25385	6.0	21355	0.0777	0.0028	0.0035
4.0	25385	6.0	23991	0.2123	0.3098	0.0130
4.0	25385	6.0	25668	0.0156	0.0056	0.0574
4.0	191	7.0	9958	0.0	0.0174	0.3030
4.0	191	7.0	16285	0.0	0.0232	0.1083
4.0	191	7.0	23268	0.0	0.0018	0.0054
4.0	191	7.0	26017	0.0	0.0031	0.0006
4.0	10752	7.0	9958	0.0	0.0602	0.0452
4.0	10752	7.0	16285	0.0	0.1295	0.4100
4.0	10752	7.0	23268	0.0	0.0005	0.0032
4.0	10752	7.0	26017	0.0	0.0670	0.1196
4.0	15298	7.0	9958	0.0	0.4097	0.1452
4.0	15298	7.0	16285	0.0	0.0107	0.0896
4.0	15298	7.0	23268	0.0	0.0371	0.0005
4.0	15298	7.0	26017	0.0	0.0074	0.0002
4.0	17600	7.0	9958	0.0	0.1535	0.0037
4.0	17600	7.0	16285	0.0	0.1123	0.5026
4.0	17600	7.0	23268	0.0	0.0000	0.0036
4.0	17600	7.0	26017	0.0	0.0050	0.0036
4.0	21381	7.0	9958	0.0	0.0561	0.0374

Appendix XIII (Continued)

J1	LEVEL 1	J2	LEVEL 2	(U2)2	(U4)2	(U6)2
4.0	21381	7.0	16285	0.0	0.0082	0.2850
4.0	21381	7.0	23268	0.0	0.0449	0.0224
4.0	21381	7.0	26017	0.0	0.0554	0.0958
4.0	24007	7.0	9958	0.0	0.0016	0.0183
4.0	24007	7.0	16285	0.0	0.0150	0.0471
4.0	24007	7.0	23268	0.0	0.0215	0.0278
4.0	24007	7.0	26017	0.0	0.0470	0.0023
4.0	25385	7.0	9958	0.0	0.0069	0.0190
4.0	25385	7.0	16285	0.0	0.0000	0.0000
4.0	25385	7.0	23268	0.0	0.0010	0.0260
4.0	25385	7.0	26017	0.0	0.0082	0.1704
4.0	191	8.0	12315	0.0	0.0055	0.0903
4.0	191	8.0	17764	0.0	0.0323	0.1033
4.0	191	8.0	22975	0.0	0.0050	0.0003
4.0	191	8.0	24476	0.0	0.0081	0.0115
4.0	10752	8.0	12315	0.0	0.1974	0.5601
4.0	10752	8.0	17764	0.0	0.0882	0.2004
4.0	10752	8.0	22975	0.0	0.0104	0.0441
4.0	10752	8.0	24476	0.0	0.0003	0.0001
4.0	15298	8.0	12315	0.0	0.1280	0.1374
4.0	15298	8.0	17764	0.0	0.1053	0.3444
4.0	15298	8.0	22975	0.0	0.0011	0.0069
4.0	15298	8.0	24476	0.0	0.0008	0.0147
4.0	17600	8.0	12315	0.0	0.0142	0.0001
4.0	17600	8.0	17764	0.0	0.0287	0.2983
4.0	17600	8.0	22975	0.0	0.0568	0.0008
4.0	17600	8.0	24476	0.0	0.0126	0.0157
4.0	21381	8.0	12315	0.0	0.4642	0.0009
4.0	21381	8.0	17764	0.0	0.0104	0.0518
4.0	21381	8.0	22975	0.0	0.0001	0.0077
4.0	21381	8.0	24476	0.0	0.0755	0.1998
4.0	24007	8.0	12315	0.0	0.0497	0.0061
4.0	24007	8.0	17764	0.0	0.0180	0.0055
4.0	24007	8.0	22975	0.0	0.0204	0.0001
4.0	24007	8.0	24476	0.0	0.0550	0.1491
4.0	25385	8.0	12315	0.0	0.1036	0.1420
4.0	25385	8.0	17764	0.0	0.0078	0.0484
4.0	25385	8.0	22975	0.0	0.4312	0.1638
4.0	25385	8.0	24476	0.0	0.0434	0.0070
4.0	191	9.0	23300	0.0	0.0	0.0047
4.0	10752	9.0	23300	0.0	0.0	0.1454
4.0	15298	9.0	23300	0.0	0.0	0.0273
4.0	17600	9.0	23300	0.0	0.0	0.0434
4.0	21381	9.0	23300	0.0	0.0	0.0305
4.0	24007	9.0	23300	0.0	0.0	0.7720
4.0	25385	9.0	23300	0.0	0.0	0.0179
5.0	3954	5.0	3954	0.1244	0.0702	0.0443
5.0	3954	5.0	15070	0.0106	0.1021	0.0136
5.0	3954	5.0	18593	0.0133	0.0345	0.2509

Appendix XIII (Continued)

J1	LEVEL 1	J2	LEVEL 2	(U2)2	(U4)2	(U6)2
5.0	3954	5.0	21077	0.0010	0.0469	0.0023
5.0	3954	5.0	21809	0.0000	0.0010	0.0096
5.0	15070	5.0	15070	0.0436	0.4080	0.0128
5.0	15070	5.0	18593	0.1882	0.0000	0.0002
5.0	15070	5.0	21077	0.0061	0.0206	0.0068
5.0	15070	5.0	21809	0.0267	0.0001	0.0019
5.0	18593	5.0	18593	0.5022	0.0673	0.2787
5.0	18593	5.0	21077	0.1189	0.1885	0.0971
5.0	18593	5.0	21809	0.0300	0.0000	0.0018
5.0	21077	5.0	21077	0.0916	0.3005	0.0000
5.0	21077	5.0	21809	0.0259	0.0680	0.0032
5.0	21809	5.0	21809	0.0237	0.0003	0.1427
5.0	3954	6.0	7231	0.0344	0.1065	0.5616
5.0	3954	6.0	15087	0.0000	0.0138	0.1729
5.0	3954	6.0	21355	0.0005	0.0044	0.0223
5.0	3954	6.0	23991	0.0067	0.0007	0.0123
5.0	3954	6.0	25668	0.0093	0.0003	0.0003
5.0	15070	6.0	7231	0.0744	0.2681	0.0207
5.0	15070	6.0	15087	0.0047	0.0023	0.1515
5.0	15070	6.0	21355	0.6376	0.4524	0.0588
5.0	15070	6.0	23991	0.0453	0.0184	0.0157
5.0	15070	6.0	25668	0.0325	0.0347	0.1366
5.0	18593	6.0	7231	0.0888	0.0685	0.5366
5.0	18593	6.0	15087	0.0002	0.0016	0.0282
5.0	18593	6.0	21355	0.5396	0.0037	0.3044
5.0	18593	6.0	23991	0.1399	0.0342	0.0308
5.0	18593	6.0	25668	0.0016	0.0142	0.0206
5.0	21077	6.0	7231	0.0857	0.2178	0.0573
5.0	21077	6.0	15087	0.0294	0.0189	0.4440
5.0	21077	6.0	21355	0.0162	0.2357	0.0225
5.0	21077	6.0	23991	0.0559	0.0342	0.0003
5.0	21077	6.0	25668	0.0572	0.0074	0.1881
5.0	21809	6.0	7231	0.0286	0.0000	0.0015
5.0	21809	6.0	15087	0.3042	0.0342	0.0040
5.0	21809	6.0	21355	0.0015	0.0081	0.0162
5.0	21809	6.0	23991	0.0825	0.0079	0.0012
5.0	21809	6.0	25668	0.2206	0.0794	0.0985
5.0	3954	7.0	9958	0.0093	0.0573	0.6603
5.0	3954	7.0	16285	0.0012	0.0004	0.1427
5.0	3954	7.0	23268	0.0086	0.0021	0.0191
5.0	3954	7.0	26017	0.0000	0.0053	0.0036
5.0	15070	7.0	9958	0.2571	0.2514	0.2857
5.0	15070	7.0	16285	0.0001	0.0672	0.0278
5.0	15070	7.0	23268	0.0017	0.0094	0.1579
5.0	15070	7.0	26017	0.0077	0.0260	0.1424
5.0	18593	7.0	9958	0.5262	0.0001	0.2249
5.0	18593	7.0	16285	0.0138	0.0014	0.0357
5.0	18593	7.0	23268	0.0050	0.0293	0.0411
5.0	18593	7.0	26017	0.0005	0.0237	0.0138

Appendix XIII (Continued)

J1	LEVEL 1	J2	LEVEL 2	(U2)2	(U4)2	(U6)2
5.0	21077	7.0	9958	0.3882	0.1288	0.0254
5.0	21077	7.0	16285	0.2019	0.0163	0.0003
5.0	21077	7.0	23268	0.0001	0.0853	0.1271
5.0	21077	7.0	26017	0.0009	0.1587	0.0250
5.0	21809	7.0	9958	0.0194	0.0385	0.0002
5.0	21809	7.0	16285	0.1560	0.1168	0.0066
5.0	21809	7.0	23268	0.0637	0.0151	0.7722
5.0	21809	7.0	26017	0.0008	0.1381	0.0000
5.0	3954	8.0	12315	0.0	0.0049	0.1959
5.0	3954	8.0	17764	0.0	0.0000	0.0085
5.0	3954	8.0	22975	0.0	0.0097	0.0356
5.0	3954	8.0	24476	0.0	0.0000	0.0051
5.0	15070	8.0	12315	0.0	0.0052	0.5341
5.0	15070	8.0	17764	0.0	0.1625	0.0306
5.0	15070	8.0	22975	0.0	0.0166	0.3848
5.0	15070	8.0	24476	0.0	0.0016	0.0104
5.0	18593	8.0	12315	0.0	0.7912	0.0015
5.0	18593	8.0	17764	0.0	0.0493	0.0508
5.0	18593	8.0	22975	0.0	0.0023	0.1410
5.0	18593	8.0	24476	0.0	0.1341	0.1225
5.0	21077	8.0	12315	0.0	0.0149	0.0008
5.0	21077	8.0	17764	0.0	0.2208	0.1746
5.0	21077	8.0	22975	0.0	0.0001	0.4891
5.0	21077	8.0	24476	0.0	0.0755	0.2164
5.0	21809	8.0	12315	0.0	0.0536	0.1063
5.0	21809	8.0	17764	0.0	0.1832	0.0735
5.0	21809	8.0	22975	0.0	0.1614	0.1421
5.0	21809	8.0	24476	0.0	0.1285	0.0894
5.0	3954	9.0	23300	0.0	0.0274	0.0604
5.0	15070	9.0	23300	0.0	0.0392	0.1242
5.0	18593	9.0	23300	0.0	0.0533	0.1364
5.0	21077	9.0	23300	0.0	0.0271	0.1064
5.0	21809	9.0	23300	0.0	0.3373	0.0483
6.0	7231	6.0	7231	0.0971	0.0454	0.0448
6.0	7231	6.0	15087	0.0210	0.0114	0.0010
6.0	7231	6.0	21355	0.0124	0.0979	0.1204
6.0	7231	6.0	23991	0.0008	0.0125	0.0200
6.0	7231	6.0	25668	0.0007	0.0071	0.0082
6.0	15087	6.0	15087	0.0083	0.0101	0.0163
6.0	15087	6.0	21355	0.0001	0.0002	0.0095
6.0	15087	6.0	23991	0.0036	0.0194	0.2781
6.0	15087	6.0	25668	0.0029	0.0000	0.0114
6.0	21355	6.0	21355	0.0000	0.3183	0.2086
6.0	21355	6.0	23991	0.0520	0.1465	0.0280
6.0	21355	6.0	25668	0.0406	0.0750	0.0001
6.0	23991	6.0	23991	0.0087	0.7115	0.1204
6.0	23991	6.0	25668	0.0689	0.0947	0.0328
6.0	25668	6.0	25668	0.0797	0.0040	0.0259
6.0	7231	7.0	9958	0.0502	0.0876	0.6152

Appendix XIII (Continued)

J1	LEVEL 1	J2	LEVEL 2	(U2)2	(U4)2	(U6)2
6.0	7231	7.0	16285	0.0069	0.0632	0.3622
6.0	7231	7.0	23268	0.0063	0.0000	0.0115
6.0	7231	7.0	26017	0.0045	0.0011	0.0001
6.0	15087	7.0	9958	0.0073	0.0346	0.1445
6.0	15087	7.0	16285	0.1931	0.0646	0.2945
6.0	15087	7.0	23268	0.0681	0.0629	0.7336
6.0	15087	7.0	26017	0.0004	0.0256	0.0291
6.0	21355	7.0	9958	0.1536	0.4304	0.2473
6.0	21355	7.0	16285	0.0030	0.0100	0.0000
6.0	21355	7.0	23268	0.0000	0.0000	0.0346
6.0	21355	7.0	26017	0.0254	0.0415	0.0704
6.0	23991	7.0	9958	0.0000	0.0590	0.1289
6.0	23991	7.0	16285	0.0251	0.0000	0.4710
6.0	23991	7.0	23268	0.0541	0.0000	0.1611
6.0	23991	7.0	26017	0.1432	0.1292	0.1203
6.0	25668	7.0	9958	0.1113	0.0067	0.0003
6.0	25668	7.0	16285	0.0763	0.0154	0.0656
6.0	25668	7.0	23268	0.0899	0.0031	0.1012
6.0	25668	7.0	26017	0.4783	0.0435	0.1077
6.0	7231	8.0	12315	0.0025	0.0513	0.3705
6.0	7231	8.0	17764	0.0038	0.0160	0.3775
6.0	7231	8.0	22975	0.0093	0.0198	0.0587
6.0	7231	8.0	24476	0.0045	0.0157	0.0139
6.0	15087	8.0	12315	0.0001	0.0271	0.1857
6.0	15087	8.0	17764	0.0018	0.3805	0.5487
6.0	15087	8.0	22975	0.0052	0.2395	0.0827
6.0	15087	8.0	24476	0.0184	0.0915	0.7506
6.0	21355	8.0	12315	1.3595	0.7434	0.1741
6.0	21355	8.0	17764	0.1089	0.1105	0.0005
6.0	21355	8.0	22975	0.0033	0.0363	0.0533
6.0	21355	8.0	24476	0.0347	0.0012	0.0252
6.0	23991	8.0	12315	0.0867	0.1791	0.0033
6.0	23991	8.0	17764	0.0894	0.0322	0.0044
6.0	23991	8.0	22975	0.1613	0.0284	0.0101
6.0	23991	8.0	24476	0.0103	0.0145	0.0700
6.0	25668	8.0	12315	0.0943	0.0193	0.1483
6.0	25668	8.0	17764	0.0006	0.2163	0.1464
6.0	25668	8.0	22975	0.2550	0.0005	0.0814
6.0	25668	8.0	24476	0.0597	0.1566	0.4538
6.0	7231	9.0	23300	0.0	0.0012	0.0164
6.0	15087	9.0	23300	0.0	0.0000	0.3973
6.0	21355	9.0	23300	0.0	0.0615	0.0100
6.0	23991	9.0	23300	0.0	0.6643	0.1028
6.0	25668	9.0	23300	0.0	0.2764	0.0045
7.0	9958	7.0	9958	0.0488	0.0571	0.0444
7.0	9958	7.0	16285	0.1152	0.0525	0.0538
7.0	9958	7.0	23268	0.0010	0.0002	0.0801
7.0	9958	7.0	26017	0.0019	0.0000	0.1088
7.0	16285	7.0	16285	0.2030	0.1150	0.6301

Appendix XIII (Continued)

J1	LEVEL 1	J2	LEVEL 2	(U2)2	(U4)2	(U6)2
7.0	16285	7.0	23268	0.1085	0.1873	0.0246
7.0	16285	7.0	26017	0.0022	0.0014	0.3810
7.0	23268	7.0	23268	0.0855	0.2459	0.2701
7.0	23268	7.0	26017	0.0020	0.0097	0.0175
7.0	26017	7.0	26017	0.0620	0.2680	0.0062
7.0	9958	8.0	12315	0.0575	0.0247	0.8555
7.0	9958	8.0	17764	0.0227	0.2378	0.2893
7.0	9958	8.0	22975	0.0089	0.0063	0.1720
7.0	9958	8.0	24476	0.0096	0.0194	0.0717
7.0	16285	8.0	12315	0.0175	0.1582	0.0977
7.0	16285	8.0	17764	0.2749	0.5427	0.0207
7.0	16285	8.0	22975	0.0070	0.0070	0.0108
7.0	16285	8.0	24476	0.0636	0.4105	0.4217
7.0	23268	8.0	12315	0.0007	0.0005	0.0694
7.0	23268	8.0	17764	0.0084	0.1191	0.1351
7.0	23268	8.0	22975	0.2841	0.0703	0.8835
7.0	23268	8.0	24476	0.0618	0.0329	0.1004
7.0	26017	8.0	12315	0.1508	0.0014	0.2933
7.0	26017	8.0	17764	0.0849	0.0012	0.3729
7.0	26017	8.0	22975	0.0011	0.0189	0.0631
7.0	26017	8.0	24476	0.1948	0.0563	0.1980
7.0	9958	9.0	23300	0.0097	0.0680	0.4579
7.0	16285	9.0	23300	0.0032	0.0033	0.8809
7.0	23268	9.0	23300	0.0090	0.5554	0.5215
7.0	26017	9.0	23300	0.2644	0.1269	0.1056
8.0	12315	8.0	12315	0.0058	0.1862	0.8695
8.0	12315	8.0	17764	0.3268	0.0084	0.1802
8.0	12315	8.0	22975	0.0014	0.0314	0.3903
8.0	12315	8.0	24476	0.0032	0.0277	0.1516
8.0	17764	8.0	17764	0.7966	0.1336	0.0212
8.0	17764	8.0	22975	0.0434	0.0185	1.1686
8.0	17764	8.0	24476	0.3729	0.0129	0.1125
8.0	22975	8.0	22975	0.6525	0.6957	0.0796
8.0	22975	8.0	24476	0.0009	0.0016	0.0806
8.0	24476	8.0	24476	0.4580	0.0049	0.0910
8.0	12315	9.0	23300	0.0513	0.2877	0.1291
8.0	17764	9.0	23300	0.0088	0.2951	0.2240
8.0	22975	9.0	23300	0.3344	0.7916	0.0397
8.0	24476	9.0	23300	0.0467	0.0380	0.0018
9.0	23300	9.0	23300	2.2175	0.0014	0.0206

Appendix XIV
Matrix Elements of (Uλ)2 for Pu^{3+}:$LaCl_3$ with Ground State, J1 = 2.5

J2	LEVEL	(U2)2	(U4)2	(U6)2
3.5	3327	0.1312	0.1215	0.1877
4.5	6254	0.0541	0.1350	0.2960
1.5	6745	0.1481	0.1159	0.0
2.5	6751	0.0144	0.3748	0.0
0.5	6925	0.1513	0.0	0.0
5.5	8783	0.0	0.0116	0.2610
3.5	9572	0.0025	0.1947	0.3456
6.5	10961	0.0	0.0136	0.1963
4.5	12306	0.0000	0.0309	0.2873
7.5	12515	0.0	0.0	0.1562
2.5	13694	0.0003	0.0000	0.0
5.5	14853	0.0	0.0004	0.0900
1.5	16128	0.0004	0.0000	0.0
7.5	16449	0.0	0.0	0.2079
2.5	17228	0.0068	0.0124	0.0
4.5	17471	0.0222	0.0071	0.0100
6.5	17678	0.0	0.0889	0.1685
5.5	17714	0.0	0.0002	0.0617
3.5	18307	0.0052	0.0050	0.0061
1.5	19365	0.0028	0.1431	0.0
0.5	20240	0.0000	0.0	0.0
8.5	20775	0.0	0.0	0.0114
4.5	21797	0.0004	0.0036	0.0066
2.5	22017	0.0000	0.0096	0.0
7.5	22451	0.0	0.0	0.0046
3.5	22635	0.009	0.0214	0.0018
4.5	23063	0.0001	0.0147	0.0115
3.5	23324	0.0000	0.0008	0.0574
5.5	23355	0.0	0.0053	0.0093
6.5	23695	0.0	0.0077	0.0001
9.5	23819	0.0	0.0	0.0
2.5	23973	0.0016	0.0095	0.0
7.5	24060	0.0	0.0	0.0097
5.5	24699	0.0	0.0003	0.0001
1.5	25141	0.0021	0.0317	0.0
6.5	25255	0.0	0.0048	0.0071
10.5	25617	0.0	0.0	0.0
8.5	25700	0.0	0.0	0.0000
3.5	25758	0.0002	0.0007	0.0144
6.5	25810	0.0	0.0004	0.0002
4.5	26072	0.0023	0.0123	0.0039
3.5	26341	0.0014	0.0000	0.0106
2.5	26965	0.0048	0.0001	0.0
3.5	27168	0.0010	0.0048	0.0103
5.5	27220	0.0	0.0065	0.0057
1.5	27542	0.0000	0.0094	0.0

Appendix XIV (Continued)
Matrix Elements of (Uλ)2 for Pu^{3+}:$LaCl_3$ (to 28000 cm^{-1})

J1	LEVEL 1	J2	LEVEL 2	(U2)2	(U4)2	(U6)2
0.5	6925	1.5	6745	0.0096	0.0	0.0
0.5	6925	1.5	16128	0.0024	0.0	0.0
0.5	6925	1.5	19365	0.2122	0.0	0.0
0.5	6925	1.5	25141	0.0076	0.0	0.0
0.5	6925	1.5	27542	0.0040	0.0	0.0
0.5	20240	1.5	6745	0.0007	0.0	0.0
0.5	20240	1.5	16128	0.0000	0.0	0.0
0.5	20240	1.5	19365	0.0018	0.0	0.0
0.5	20240	1.5	25141	0.0002	0.0	0.0
0.5	20240	1.5	27542	0.1339	0.0	0.0
0.5	6925	2.5	56	0.1513	0.0	0.0
0.5	6925	2.5	6751	0.0351	0.0	0.0
0.5	6925	2.5	13694	0.0003	0.0	0.0
0.5	6925	2.5	17228	0.0278	0.0	0.0
0.5	6925	2.5	22017	0.0017	0.0	0.0
0.5	6925	2.5	23973	0.0001	0.0	0.0
0.5	6925	2.5	26965	0.0033	0.0	0.0
0.5	20240	2.5	56	0.0000	0.0	0.0
0.5	20240	2.5	6751	0.0120	0.0	0.0
0.5	20240	2.5	13694	0.0247	0.0	0.0
0.5	20240	2.5	17228	0.0007	0.0	0.0
0.5	20240	2.5	22017	0.0603	0.0	0.0
0.5	20240	2.5	23973	0.0148	0.0	0.0
0.5	20240	2.5	26965	0.0100	0.0	0.0
0.5	6925	3.5	3327	0.0	0.1149	0.0
0.5	6925	3.5	9572	0.0	0.0641	0.0
0.5	6925	3.5	18307	0.0	0.0000	0.0
0.5	6925	3.5	22635	0.0	0.0000	0.0
0.5	6925	3.5	23324	0.0	0.1209	0.0
0.5	6925	3.5	25758	0.0	0.0197	0.0
0.5	6925	3.5	26341	0.0	0.0027	0.0
0.5	6925	3.5	27168	0.0	0.0042	0.0
0.5	20240	3.5	3327	0.0	0.0014	0.0
0.5	20240	3.5	9572	0.0	0.0000	0.0
0.5	20240	3.5	18307	0.0	0.0042	0.0
0.5	20240	3.5	22635	0.0	0.1762	0.0
0.5	20240	3.5	23324	0.0	0.0424	0.0
0.5	20240	3.5	25758	0.0	0.0141	0.0
0.5	20240	3.5	26341	0.0	0.0377	0.0
0.5	20240	3.5	27168	0.0	0.0327	0.0
0.5	6925	4.5	6254	0.0	0.1533	0.0
0.5	6925	4.5	12306	0.0	0.0153	0.0
0.5	6925	4.5	17471	0.0	0.0061	0.0
0.5	6925	4.5	21797	0.0	0.0014	0.0
0.5	6925	4.5	23063	0.0	0.0057	0.0
0.5	6925	4.5	26072	0.0	0.0046	0.0

Appendix XIV (Continued)

J1	LEVEL 1	J2	LEVEL 2	(U2)2	(U4)2	(U6)2
0.5	20240	4.5	6254	0.0	0.0000	0.0
0.5	20240	4.5	12306	0.0	0.0001	0.0
0.5	20240	4.5	17471	0.0	0.0853	0.0
0.5	20240	4.5	21797	0.0	0.0232	0 0
0.5	20240	4.5	23063	0.0	0.0287	0.0
0.5	20240	4.5	26072	0.0	0.0993	0.0
0.5	6925	5.5	8783	0.0	0.0	0.2872
0.5	6925	5.5	14853	0.0	0.0	0.0119
0.5	6925	5.5	17714	0.0	0.0	0.0180
0.5	6925	5.5	23355	0.0	0.0	0.0581
0.5	6925	5.5	24699	0.0	0.0	0.0023
0.5	6925	5.5	27220	0.0	0.0	0.0065
0.5	20240	5.5	8783	0.0	0.0	0.0145
0.5	20240	5.5	14853	0.0	0.0	0.0002
0.5	20240	5.5	17714	0.0	0.0	0.0021
0.5	20240	5.5	23355	0.0	0.0	0.1028
0.5	20240	5.5	24699	0.0	0.0	0.1367
0.5	20240	5.5	27220	0.0	0.0	0.0407
0.5	6925	6.5	10961	0.0	0.0	0.0844
0.5	6925	6.5	17678	0.0	0.0	0.0241
0.5	6925	6.5	23695	0.0	0.0	0.0034
0.5	6925	6.5	25255	0.0	0.0	0.0156
0.5	6925	6.5	25810	0.0	0.0	0.0241
0.5	20240	6.5	10961	0.0	0.0	0.0057
0.5	20240	6.5	17678	0.0	0.0	0.0051
0.5	20240	6.5	23695	0.0	0.0	0.0482
0.5	20240	6.5	25255	0.0	0.0	0.0995
0.5	20240	6.5	25810	0.0	0.0	0.0969
1.5	6745	1.5	6745	0.0170	0.0	0.0
1.5	6745	1.5	16128	0.0102	0.0	0.0
1.5	6745	1.5	19365	0.2745	0.0	0.0
1.5	6745	1.5	25141	0.0162	0.0	0.0
1.5	6745	1.5	27542	0.0181	0.0	0.0
1.5	16128	1.5	16128	0.0015	0.0	0.0
1.5	16128	1.5	19365	0.0043	0.0	0.0
1.5	16128	1.5	25141	0.0424	0.0	0.0
1.5	16128	1.5	27542	0.0170	0.0	0.0
1.5	19365	1.5	19365	0.0281	0.0	0.0
1.5	19365	1.5	25141	0.0024	0.0	0.0
1.5	19365	1.5	27542	0.0009	0.0	0.0
1.5	25141	1.5	25141	0.0009	0.0	0.0
1.5	25141	1.5	27542	0.0021	0.0	0.0
1.5	27542	1.5	27542	0.0309	0.0	0.0
1.5	6745	2.5	56	0.1481	0.1159	0.0
1.5	6745	2.5	6751	0.0000	0.0694	0.0
1.5	6745	2.5	13694	0.0275	0.0001	0.0
1.5	6745	2.5	17228	0.1027	0.0287	0.0
1.5	6745	2.5	22017	0.0002	0.0038	0.0
1.5	6745	2.5	23973	0.0183	0.0022	0.0

Appendix XIV (Continued)

J1	LEVEL 1	J2	LEVEL 2	(U2)2	(U4)2	(U6)2
1.5	6745	2.5	26965	0.0020	0.0008	0.0
1.5	16128	2.5	56	0.0004	0.0000	0.0
1.5	16128	2.5	6751	0.0030	0.0053	0.0
1.5	16128	2.5	13694	0.0489	0.0081	0.0
1.5	16128	2.5	17228	0.0324	0.0632	0.0
1.5	16128	2.5	22017	0.0502	0.0006	0.0
1.5	16128	2.5	23973	0.0191	0.1278	0.0
1.5	16128	2.5	26965	0.0020	0.0278	0.0
1.5	19365	2.5	56	0.0028	0.1431	0.0
1.5	19365	2.5	6751	0.1634	0.0213	0.0
1.5	19365	2.5	13694	0.0728	0.0002	0.0
1.5	19365	2.5	17228	0.1122	0.0009	0.0
1.5	19365	2.5	22017	0.0095	0.0193	0.0
1.5	19365	2.5	23973	0.0203	0.0056	0.0
1.5	19365	2.5	26965	0.0004	0.0000	0.0
1.5	25141	2.5	56	0.0021	0.0317	0.0
1.5	25141	2.5	6751	0.0271	0.0025	0.0
1.5	25141	2.5	13694	0.0366	0.0000	0.0
1.5	25141	2.5	17228	0.0055	0.0044	0.0
1.5	25141	2.5	22017	0.0000	0.1299	0.0
1.5	25141	2.5	23973	0.0816	0.0029	0.0
1.5	25141	2.5	26965	0.0415	0.0013	0.0
1.5	27542	2.5	56	0.0000	0.0094	0.0
1.5	27542	2.5	6751	0.0081	0.0053	0.0
1.5	27542	2.5	13694	0.0144	0.0002	0.0
1.5	27542	2.5	17228	0.0120	0.0018	0.0
1.5	27542	2.5	22017	0.0228	0.0460	0.0
1.5	27542	2.5	23973	0.0022	0.0390	0.0
1.5	27542	2.5	26965	0.0001	0.0457	0.0
1.5	6745	3.5	3327	0.1636	0.1224	0.0
1.5	6745	3.5	9572	0.0362	0.0102	0.0
1.5	6745	3.5	18307	0.0171	0.0081	0.0
1.5	6745	3.5	22635	0.0000	0.0130	0.0
1.5	6745	3.5	23324	0.0011	0.1446	0.0
1.5	6745	3.5	25758	0.0008	0.0081	0.0
1.5	6745	3.5	26341	0.0035	0.0213	0.0
1.5	6745	3.5	27168	0.0047	0.0536	0.0
1.5	16128	3.5	3327	0.0581	0.0008	0.0
1.5	16128	3.5	9572	0.0035	0.0095	0.0
1.5	16128	3.5	18307	0.0278	0.1265	0.0
1.5	16128	3.5	22635	0.0170	0.0002	0.0
1.5	16128	3.5	23324	0.0086	0.0480	0.0
1.5	16128	3.5	25758	0.0041	0.0000	0.0
1.5	16128	3.5	26341	0.0135	0.0056	0.0
1.5	16128	3.5	27168	0.0062	0.0092	0.0
1.5	19365	3.5	3327	0.0021	0.1374	0.0
1.5	19365	3.5	9572	0.1059	0.0576	0.0
1.5	19365	3.5	18307	0.0038	0.0003	0.0
1.5	19365	3.5	22635	0.0318	0.0059	0.0

Appendix XIV (Continued)

J1	LEVEL 1	J2	LEVEL 2	(U2)2	(U4)2	(U6)2
1.5	19365	3.5	23324	0.5637	0.0000	0.0
1.5	19365	3.5	25758	0.0214	0.0320	0.0
1.5	19365	3.5	26341	0.0199	0.0007	0.0
1.5	19365	3.5	27168	0.0058	0.0012	0.0
1.5	25141	3.5	3327	0.0007	0.0108	0.0
1.5	25141	3.5	9572	0.0090	0.0016	0.0
1.5	25141	3.5	18307	0.0215	0.0671	0.0
1.5	25141	3.5	22635	0.0070	0.0036	0.0
1.5	25141	3.5	23324	0.0001	0.0075	0.0
1.5	25141	3.5	25758	0.1438	0.0869	0.0
1.5	25141	3.5	26341	0.0115	0.0038	0.0
1.5	25141	3.5	27168	0.0670	0.0058	0.0
1.5	27542	3.5	3327	0.0001	0.0209	0.0
1.5	27542	3.5	9572	0.0263	0.0020	0.0
1.5	27542	3.5	18307	0.0001	0.0128	0.0
1.5	27542	3.5	22635	0.0002	0.0291	0.0
1.5	27542	3.5	23324	0.0081	0.0001	0.0
1.5	27542	3.5	25758	0.0016	0.0435	0.0
1.5	27542	3.5	26341	0.0000	0.0016	0.0
1.5	27542	3.5	27168	0.2324	0.0569	0.0
1.5	6745	4.5	6254	0.0	0.0803	0.2863
1.5	6745	4.5	12306	0.0	0.0356	0.0009
1.5	6745	4.5	17471	0.0	0.0000	0.0175
1.5	6745	4.5	21797	0.0	0.0001	0.1115
1.5	6745	4.5	23063	0.0	0.0005	0.0037
1.5	6745	4.5	26072	0.0	0.0016	0.0594
1.5	16128	4.5	6254	0.0	0.0198	0.0599
1.5	16128	4.5	12306	0.0	0.0038	0.0003
1.5	16128	4.5	17471	0.0	0.0907	0.0662
1.5	16128	4.5	21797	0.0	0.0129	0.3636
1.5	16128	4.5	23063	0.0	0.0800	0.0138
1.5	16128	4.5	26072	0.0	0.0001	0.0006
1.5	19365	4.5	6254	0.0	0.0821	0.0000
1.5	19365	4.5	12306	0.0	0.1478	0.0001
1.5	19365	4.5	17471	0.0	0.0144	0.0014
1.5	19365	4.5	21797	0.0	0.0427	0.0049
1.5	19365	4.5	23063	0.0	0.0031	0.0001
1.5	19365	4.5	26072	0.0	0.0101	0.0019
1.5	25141	4.5	6254	0.0	0.0016	0.0199
1.5	25141	4.5	12306	0.0	0.0112	0.0066
1.5	25141	4.5	17471	0.0	0.1050	0.0788
1.5	25141	4.5	21797	0.0	0.1468	0.0926
1.5	25141	4.5	23063	0.0	0.0148	0.0429
1.5	25141	4.5	26072	0.0	0.0217	0.0511
1.5	27542	4.5	6254	0.0	0.0136	0.0024
1.5	27542	4.5	12306	0.0	0.0097	0.0108
1.5	27542	4.5	17471	0.0	0.0029	0.1247
1.5	27542	4.5	21797	0.0	0.0674	0.0353
1.5	27542	4.5	23063	0.0	0.0043	0.0404

Appendix XIV (Continued)

J1	LEVEL 1	J2	LEVEL 2	(U2)2	(U4)2	(U6)2
1.5	27542	4.5	26072	0.0	0.0549	0.0072
1.5	6745	5.5	8783	0.0	0.2419	0.0332
1.5	6745	5.5	14853	0.0	0.0131	0.0412
1.5	6745	5.5	17714	0.0	0.0469	0.0001
1.5	6745	5.5	23355	0.0	0.0020	0.0132
1.5	6745	5.5	24699	0.0	0.0018	0.0019
1.5	6745	5.5	27220	0.0	0.0188	0.0291
1.5	16128	5.5	8783	0.0	0.0005	0.0064
1.5	16128	5.5	14853	0.0	0.0000	0.0000
1.5	16128	5.5	17714	0.0	0.3821	0.0780
1.5	16128	5.5	23355	0.0	0.0050	0.1480
1.5	16128	5.5	24699	0.0	0.0255	0.0427
1.5	16128	5.5	27220	0.0	0.0465	0.0534
1.5	19365	5.5	8783	0.0	0.0222	0.0000
1.5	19365	5.5	14853	0.0	0.3750	0.0020
1.5	19365	5.5	17714	0.0	0.0002	0.0666
1.5	19365	5.5	23355	0.0	0.0423	0.0003
1.5	19365	5.5	24699	0.0	0.0083	0.0161
1.5	19365	5.5	27220	0.0	0.0044	0.0001
1.5	25141	5.5	8783	0.0	0.0005	0.0413
1.5	25141	5.5	14853	0.0	0.0486	0.0003
1.5	25141	5.5	17714	0.0	0.0411	0.0330
1.5	25141	5.5	23355	0.0	0.0248	0.0100
1.5	25141	5.5	24699	0.0	0.0345	0.0488
1.5	25141	5.5	27220	0.0	0.0424	0.0183
1.5	27542	5.5	8783	0.0	0.0082	0.0177
1.5	27542	5.5	14853	0.0	0.0244	0.0013
1.5	27542	5.5	17714	0.0	0.0284	0.0488
1.5	27542	5.5	23355	0.0	0.0397	0.0072
1.5	27542	5.5	24699	0.0	0.0009	0.0147
1.5	27542	5.5	27220	0.0	0.0928	0.0005
1.5	6745	6.5	10961	0.0	0.0	0.3583
1.5	6745	6.5	17678	0.0	0.0	0.0061
1.5	6745	6.5	23695	0.0	0.0	0.0001
1.5	6745	6.5	25255	0.0	0.0	0.0135
1.5	6745	6.5	25810	0.0	0.0	0.0171
1.5	16128	6.5	10961	0.0	0.0	0.0080
1.5	16128	6.5	17678	0.0	0.0	0.0192
1.5	16128	6.5	23695	0.0	0.0	0.1018
1.5	16128	6.5	25255	0.0	0.0	0.0423
1.5	16128	6.5	25810	0.0	0.0	0.0563
1.5	19365	6.5	10961	0.0	0.0	0.0270
1.5	19365	6.5	17678	0.0	0.0	0.0420
1.5	19365	6.5	23695	0.0	0.0	0.0126
1.5	19365	6.5	25255	0.0	0.0	0.0269
1.5	19365	6.5	25810	0.0	0.0	0.0057
1.5	25141	6.5	10961	0.0	0.0	0.0141
1.5	25141	6.5	17678	0.0	0.0	0.0835
1.5	25141	6.5	23695	0.0	0.0	0.0107

Appendix XIV (Continued)

J1	LEVEL 1	J2	LEVEL 2	(U2)2	(U4)2	(U6)2
1.5	25141	6.5	25255	0.0	0.0	0.0674
1.5	25141	6.5	25810	0.0	0.0	0.0081
1.5	27542	6.5	10961	0.0	0.0	0.0420
1.5	27542	6.5	17678	0.0	0.0	0 0074
1.5	27542	6.5	23695	0.0	0.0	0.0022
1.5	27542	6.5	25255	0.0	0.0	0.0046
1.5	27542	6.5	25810	0.0	0.0	0.0283
1.5	6745	7.5	12515	0.0	0.0	0.0318
1.5	6745	7.5	16449	0.0	0.0	0.1264
1.5	6745	7.5	22451	0.0	0.0	0.0002
1.5	6745	7.5	24060	0.0	0.0	0.0385
1.5	16128	7.5	12515	0.0	0.0	0.0220
1.5	16128	7.5	16449	0.0	0.0	0.1946
1.5	16128	7.5	22451	0.0	0.0	0.0677
1.5	16128	7.5	24060	0.0	0.0	0.0968
1.5	19365	7.5	12515	0.0	0.0	0.0970
1.5	19365	7.5	16449	0.0	0.0	0.0136
1.5	19365	7.5	22451	0.0	0.0	0.0191
1.5	19365	7.5	24060	0.0	0.0	0.0165
1.5	25141	7.5	12515	0.0	0.0	0.0006
1.5	25141	7.5	16449	0.0	0.0	0.0026
1.5	25141	7.5	22451	0.0	0.0	0.0384
1.5	25141	7.5	24060	0.0	0.0	0.1296
1.5	27542	7.5	12515	0.0	0.0	0.0375
1.5	27542	7.5	16449	0.0	0.0	0.0044
1.5	27542	7.5	22451	0.0	0.0	0.0061
1.5	27542	7.5	24060	0.0	0.0	0.0275
2.5	56	2.5	56	0.4509	0.0006	0.0
2.5	56	2.5	6751	0.0144	0.3748	0.0
2.5	56	2.5	13694	0.0003	0.0000	0.0
2.5	56	2.5	17228	0.0068	0.0124	0.0
2.5	56	2.5	22017	0.0000	0.0096	0.0
2.5	56	2.5	23973	0.0016	0.0095	0.0
2.5	56	2.5	26965	0.0048	0.0001	0.0
2.5	6751	2.5	6751	0.0636	0.0023	0.0
2.5	6751	2.5	13694	0.1181	0.0360	0.0
2.5	6751	2.5	17228	0.1688	0.0480	0.0
2.5	6751	2.5	22017	0.0202	0.0048	0.0
2.5	6751	2.5	23973	0.0683	0.0001	0.0
2.5	6751	2.5	26965	0.0024	0.0056	0.0
2.5	13694	2.5	13694	0.2182	0.2381	0.0
2.5	13694	2.5	17228	0.0304	0.0080	0.0
2.5	13694	2.5	22017	0.0047	0.0286	0.0
2.5	13694	2.5	23973	0.0496	0.0979	0.0
2.5	13694	2.5	26965	0.0327	0.0067	0.0
2.5	17228	2.5	17228	0.2187	0.0155	0.0
2.5	17228	2.5	22017	0.0001	0.0025	0.0
2.5	17228	2.5	23973	0.0029	0.0052	0.0
2.5	17228	2.5	26965	0.0021	0.0000	0.0

Appendix XIV (Continued)

J1	LEVEL 1	J2	LEVEL 2	(U2)2	(U4)2	(U6)2
2.5	22017	2.5	22017	0.0031	0.0049	0.0
2.5	22017	2.5	23973	0.0533	0.0013	0.0
2.5	22017	2.5	26965	0.0208	0.0070	0.0
2.5	23973	2.5	23973	0.1167	0.0116	0.0
2.5	23973	2.5	26965	0.0049	0.0020	0.0
2.5	26965	2.5	26965	0.1509	0.0172	0.0
2.5	56	3.5	3327	0.1312	0.1215	0.1877
2.5	56	3.5	9572	0.0025	0.1947	0.3456
2.5	56	3.5	18307	0.0052	0.0050	0.0061
2.5	56	3.5	22635	0.0091	0.0214	0.0018
2.5	56	3.5	23324	0.0000	0.0008	0.0574
2.5	56	3.5	25758	0.0002	0.0007	0.0144
2.5	56	3.5	26341	0.0014	0.0000	0.0106
2.5	56	3.5	27168	0.0010	0.0048	0.0103
2.5	6751	3.5	3327	0.2869	0.0151	0.1923
2.5	6751	3.5	9572	0.0305	0.0099	0.0081
2.5	6751	3.5	18307	0.0048	0.0024	0.0977
2.5	6751	3.5	22635	0.0013	0.0520	0.0432
2.5	6751	3.5	23324	0.0026	0.0869	0.0002
2.5	6751	3.5	25758	0.0010	0.0461	0.0378
2.5	6751	3.5	26341	0.0018	0.0367	0.0040
2.5	6751	3.5	27168	0.0037	0.0720	0.0080
2.5	13694	3.5	3327	0.0130	0.0333	0.1339
2.5	13694	3.5	9572	0.0039	0.0259	0.0028
2.5	13694	3.5	18307	0.0039	0.0072	0.2521
2.5	13694	3.5	22635	0.0049	0.0592	0.0090
2.5	13694	3.5	23324	0.0585	0.1342	0.0009
2.5	13694	3.5	25758	0.0014	0.0020	0.0004
2.5	13694	3.5	26341	0.0023	0.0004	0.0895
2.5	13694	3.5	27168	0.0011	0.0043	0.0009
2.5	17228	3.5	3327	0.0003	0.1646	0.0000
2.5	17228	3.5	9572	0.3491	0.1042	0.0004
2.5	17228	3.5	18307	0.0124	0.0378	0.0207
2.5	17228	3.5	22635	0.0268	0.0037	0.0208
2.5	17228	3.5	23324	0.2350	0.0001	0.0000
2.5	17228	3.5	25758	0.0281	0.0025	0.0000
2.5	17228	3.5	26341	0.0005	0.0030	0.0663
2.5	17228	3.5	27168	0.0214	0.0214	0.0000
2.5	22017	3.5	3327	0.0017	0.0000	0.0183
2.5	22017	3.5	9572	0.0110	0.0007	0.0075
2.5	22017	3.5	18307	0.1766	0.0470	0.0867
2.5	22017	3.5	22635	0.0132	0.0003	0.0059
2.5	22017	3.5	23324	0.0530	0.0092	0.0006
2.5	22017	3.5	25758	0.0318	0.0003	0.1003
2.5	22017	3.5	26341	0.0003	0.0301	0.1725
2.5	22017	3.5	27168	0.0173	0.0134	0.0001
2.5	23973	3.5	3327	0.0054	0.0321	0.0224
2.5	23973	3.5	9572	0.1750	0.0324	0.0000
2.5	23973	3.5	18307	0.0328	0.0747	0.0044

Appendix XIV (Continued)

J1	LEVEL 1	J2	LEVEL 2	(U2)2	(U4)2	(U6)2
2.5	23973	3.5	22635	0.0045	0.0026	0.0201
2.5	23973	3.5	23324	0.0892	0.0021	0.0004
2.5	23973	3.5	25758	0.0326	0.0030	0.0034
2.5	23973	3.5	26341	0.1299	0.0024	0.0029
2.5	23973	3.5	27168	0.0175	0.0379	0.0025
2.5	26965	3.5	3327	0.0006	0.0023	0.0006
2.5	26965	3.5	9572	0.0001	0.0004	0.0113
2.5	26965	3.5	18307	0.0023	0.0142	0.0067
2.5	26965	3.5	22635	0.0466	0.0165	0.0060
2.5	26965	3.5	23324	0.0006	0.0000	0.0092
2.5	26965	3.5	25758	0.0040	0.0466	0.0963
2.5	26965	3.5	26341	0.0376	0.0004	0.0501
2.5	26965	3.5	27168	0.0000	0.0019	0.0454
2.5	56	4.5	6254	0.0541	0.1350	0.2960
2.5	56	4.5	12306	0.0000	0.0309	0.2873
2.5	56	4.5	17471	0.0222	0.0071	0.0100
2.5	56	4.5	21797	0.0004	0.0036	0.0066
2.5	56	4.5	23063	0.0001	0.0147	0.0115
2.5	56	4.5	26072	0.0023	0.0123	0.0039
2.5	6751	4.5	6254	0.1763	0.0225	0.1133
2.5	6751	4.5	12306	0.0013	0.0109	0.0314
2.5	6751	4.5	17471	0.0045	0.0069	0.0625
2.5	6751	4.5	21797	0.0086	0.0083	0.0090
2.5	6751	4.5	23063	0.0051	0.0221	0.1713
2.5	6751	4.5	26072	0.0159	0.0129	0.0015
2.5	13694	4.5	6254	0.0945	0.1028	0.0007
2.5	13694	4.5	12306	0.0597	0.0162	0.0111
2.5	13694	4.5	17471	0.0651	0.0552	0.0852
2.5	13694	4.5	21797	0.0010	0.0031	0.0043
2.5	13694	4.5	23063	0.0000	0.0299	0.1759
2.5	13694	4.5	26072	0.0521	0.0503	0.0117
2.5	17228	4.5	6254	0.0008	0.1276	0.0001
2.5	17228	4.5	12306	0.3255	0.1680	0.0600
2.5	17228	4.5	17471	0.0193	0.0175	0.0099
2.5	17228	4.5	21797	0.0038	0.0017	0.0117
2.5	17228	4.5	23063	0.0276	0.0005	0.0250
2.5	17228	4.5	26072	0.0125	0.0024	0.0055
2.5	22017	4.5	6254	0.0430	0.0423	0.0000
2.5	22017	4.5	12306	0.0323	0.0277	0.0001
2.5	22017	4.5	17471	0.0524	0.0231	0.1596
2.5	22017	4.5	21797	0.0657	0.0976	0.0015
2.5	22017	4.5	23063	0.0072	0.0021	0.0132
2.5	22017	4.5	26072	0.0256	0.0009	0.1150
2.5	23973	4.5	6254	0.0003	0.0629	0.0720
2.5	23973	4.5	12306	0.1555	0.0890	0.0001
2.5	23973	4.5	17471	0.0153	0.0309	0.1653
2.5	23973	4.5	21797	0.0336	0.0053	0.0029
2.5	23973	4.5	23063	0.0585	0.0058	0.0109
2.5	23973	4.5	26072	0.0465	0.0017	0.0002

Appendix XIV (Continued)

J1	LEVEL 1	J2	LEVEL 2	(U2)2	(U4)2	(U6)2
2.5	26965	4.5	6254	0.0003	0.0000	0.0171
2.5	26965	4.5	12306	0.0000	0.0038	0.0009
2.5	26965	4.5	17471	0.1905	0.0455	0.0015
2.5	26965	4.5	21797	0.0162	0.0039	0.0057
2.5	26965	4.5	23063	0.0054	0.0908	0.0071
2.5	26965	4.5	26072	0.0702	0.0434	0.0432
2.5	56	5.5	8783	0.0	0.0116	0.2610
2.5	56	5.5	14853	0.0	0.0004	0.0900
2.5	56	5.5	17714	0.0	0.0002	0.0617
2.5	56	5.5	23355	0.0	0.0053	0.0093
2.5	56	5.5	24699	0.0	0.0003	0.0001
2.5	56	5.5	27220	0.0	0.0065	0.0057
2.5	6751	5.5	8783	0.0	0.1070	0.1704
2.5	6751	5.5	14853	0.0	0.0743	0.0560
2.5	6751	5.5	17714	0.0	0.0366	0.0391
2.5	6751	5.5	23355	0.0	0.0029	0.1203
2.5	6751	5.5	24699	0.0	0.0006	0.0012
2.5	6751	5.5	27220	0.0	0.0121	0.0066
2.5	13694	5.5	8783	0.0	0.0981	0.0621
2.5	13694	5.5	14853	0.0	0.0036	0.0005
2.5	13694	5.5	17714	0.0	0.0000	0.1873
2.5	13694	5.5	23355	0.0	0.0120	0.0648
2.5	13694	5.5	24699	0.0	0.0001	0.0003
2.5	13694	5.5	27220	0.0	0.0482	0.1088
2.5	17228	5.5	8783	0.0	0.1984	0.0374
2.5	17228	5.5	14853	0.0	0.1799	0.0025
2.5	17228	5.5	17714	0.0	0.0012	0.0975
2.5	17228	5.5	23355	0.0	0.0475	0.0029
2.5	17228	5.5	24699	0.0	0.0055	0.0445
2.5	17228	5.5	27220	0.0	0.0030	0.0366
2.5	22017	5.5	8783	0.0	0.0012	0.0019
2.5	22017	5.5	14853	0.0	0.0133	0.0034
2.5	22017	5.5	17714	0.0	0.0000	0.1972
2.5	22017	5.5	23355	0.0	0.0221	0.0776
2.5	22017	5.5	24699	0.0	0.0424	0.0061
2.5	22017	5.5	27220	0.0	0.0619	0.0011
2.5	23973	5.5	8783	0.0	0.0642	0.0355
2.5	23973	5.5	14853	0.0	0.0645	0.0001
2.5	23973	5.5	17714	0.0	0.0451	0.0129
2.5	23973	5.5	23355	0.0	0.1052	0.0056
2.5	23973	5.5	24699	0.0	0.0233	0.0358
2.5	23973	5.5	27220	0.0	0.0010	0.0140
2.5	26965	5.5	8783	0.0	0.0008	0.0103
2.5	26965	5.5	14853	0.0	0.0005	0.0056
2.5	26965	5.5	17714	0.0	0.0066	0.0047
2.5	26965	5.5	23355	0.0	0.0027	0.1938
2.5	26965	5.5	24699	0.0	0.1394	0.0191
2.5	26965	5.5	27220	0.0	0.0108	0.0000
2.5	56	6.5	10961	0.0	0.0136	0.1963

Appendix XIV (Continued)

J1	LEVEL 1	J2	LEVEL 2	(U2)2	(U4)2	(U6)2
2.5	56	6.5	17678	0.0	0.0889	0.1685
2.5	56	6.5	23695	0.0	0.0077	0.0001
2.5	56	6.5	25255	0.0	0.0048	0.0071
2.5	56	6.5	25810	0.0	0.0004	0.0002
2.5	6751	6.5	10961	0.0	0.3140	0.1426
2.5	6751	6.5	17678	0.0	0.0389	0.0078
2.5	6751	6.5	23695	0.0	0.0167	0.0070
2.5	6751	6.5	25255	0.0	0.0063	0.0049
2.5	6751	6.5	25810	0.0	0.0372	0.0319
2.5	13694	6.5	10961	0.0	0.0001	0.0223
2.5	13694	6.5	17678	0.0	0.2450	0.4667
2.5	13694	6.5	23695	0.0	0.0015	0.0082
2.5	13694	6.5	25255	0.0	0.0027	0.0064
2.5	13694	6.5	25810	0.0	0.0437	0.0764
2.5	17228	6.5	10961	0.0	0.0807	0.1875
2.5	17228	6.5	17678	0.0	0.0642	0.1615
2.5	17228	6.5	23695	0.0	0.0154	0.0389
2.5	17228	6.5	25255	0.0	0.0004	0.0000
2.5	17228	6.5	25810	0.0	0.1459	0.0167
2.5	22017	6.5	10961	0.0	0.0000	0.0002
2.5	22017	6.5	17678	0.0	0.0964	0.0557
2.5	22017	6.5	23695	0.0	0.2936	0.0030
2.5	22017	6.5	25255	0.0	0.0200	0.0058
2.5	22017	6.5	25810	0.0	0.0138	0.0189
2.5	23973	6.5	10961	0.0	0.0535	0.0008
2.5	23973	6.5	17678	0.0	0.0000	0.0672
2.5	23973	6.5	23695	0.0	0.0000	0.0094
2.5	23973	6.5	25255	0.0	0.0623	0.0010
2.5	23973	6.5	25810	0.0	0.2315	0.0000
2.5	26965	6.5	10961	0.0	0.0063	0.0000
2.5	26965	6.5	17678	0.0	0.0819	0.0056
2.5	26965	6.5	23695	0.0	0.1163	0.0771
2.5	26965	6.5	25255	0.0	0.0583	0.0035
2.5	26965	6.5	25810	0.0	0.0005	0.1600
2.5	56	7.5	12515	0.0	0.0	0.1562
2.5	56	7.5	16449	0.0	0.0	0.2079
2.5	56	7.5	22451	0.0	0.0	0.0046
2.5	56	7.5	24060	0.0	0.0	0.0097
2.5	6751	7.5	12515	0.0	0.0	0.5273
2.5	6751	7.5	16449	0.0	0.0	0.0340
2.5	6751	7.5	22451	0.0	0.0	0.0062
2.5	6751	7.5	24060	0.0	0.0	0.0154
2.5	13694	7.5	12515	0.0	0.0	0.0530
2.5	13694	7.5	16449	0.0	0.0	0.5853
2.5	13694	7.5	22451	0.0	0.0	0.0235
2.5	13694	7.5	24060	0.0	0.0	0.1292
2.5	17228	7.5	12515	0.0	0.0	0.0501
2.5	17228	7.5	16449	0.0	0.0	0.0718
2.5	17228	7.5	22451	0.0	0.0	0.0121

Appendix XIV (Continued)

J1	LEVEL 1	J2	LEVEL 2	(U2)2	(U4)2	(U6)2
2.5	17228	7.5	24060	0.0	0.0	0.1475
2.5	22017	7.5	12515	0.0	0.0	0.0262
2.5	22017	7.5	16449	0.0	0.0	0.0173
2.5	22017	7.5	22451	0.0	0.0	0.0151
2.5	22017	7.5	24060	0.0	0.0	0.1190
2.5	23973	7.5	12515	0.0	0.0	0.0107
2.5	23973	7.5	16449	0.0	0.0	0.0625
2.5	23973	7.5	22451	0.0	0.0	0.0123
2.5	23973	7.5	24060	0.0	0.0	0.2985
2.5	26965	7.5	12515	0.0	0.0	0.0000
2.5	26965	7.5	16449	0.0	0.0	0.0968
2.5	26965	7.5	22451	0.0	0.0	0.0615
2.5	26965	7.5	24060	0.0	0.0	0.0220
2.5	56	8.5	20775	0.0	0.0	0.0114
2.5	56	8.5	25700	0.0	0.0	0.0000
2.5	6751	8.5	20775	0.0	0.0	0.1165
2.5	6751	8.5	25700	0.0	0.0	0.0000
2.5	13694	8.5	20775	0.0	0.0	0.0005
2.5	13694	8.5	25700	0.0	0.0	0.0002
2.5	17228	8.5	20775	0.0	0.0	0.0241
2.5	17228	8.5	25700	0.0	0.0	0.0052
2.5	22017	8.5	20775	0.0	0.0	0.5391
2.5	22017	8.5	25700	0.0	0.0	0.0157
2.5	23973	8.5	20775	0.0	0.0	0.0006
2.5	23973	8.5	25700	0.0	0.0	0.0262
2.5	26965	8.5	20775	0.0	0.0	0.0006
2.5	26965	8.5	25700	0.0	0.0	0.0022
3.5	3327	3.5	3327	0.3320	0.0572	0.2282
3.5	3327	3.5	9572	0.0225	0.2483	0.0195
3.5	3327	3.5	18307	0.0000	0.0279	0.0229
3.5	3327	3.5	22635	0.0007	0.0125	0.0306
3.5	3327	3.5	23324	0.0012	0.0012	0.0893
3.5	3327	3.5	25758	0.0001	0.0010	0.0011
3.5	3327	3.5	26341	0.0006	0.0002	0.0192
3.5	3327	3.5	27168	0.0008	0.0000	0.0132
3.5	9572	3.5	9572	0.0000	0.0004	0.0080
3.5	9572	3.5	18307	0.0480	0.0010	0.0125
3.5	9572	3.5	22635	0.0145	0.0012	0.0197
3.5	9572	3.5	23324	0.0880	0.1328	0.0001
3.5	9572	3.5	25758	0.0194	0.0743	0.0058
3.5	9572	3.5	26341	0.0083	0.0359	0.0000
3.5	9572	3.5	27168	0.0157	0.0880	0.0197
3.5	18307	3.5	18307	0.2338	0.0883	0.0011
3.5	18307	3.5	22635	0.0006	0.0371	0.0422
3.5	18307	3.5	23324	0.0289	0.0720	0.0035
3.5	18307	3.5	25758	0.0570	0.0002	0.0162
3.5	18307	3.5	26341	0.0261	0.0572	0.0000
3.5	18307	3.5	27168	0.0164	0.0087	0.0232
3.5	22635	3.5	22635	0.0142	0.0092	0.0009

Appendix XIV (Continued)

J1	LEVEL 1	J2	LEVEL 2	(U2)2	(U4)2	(U6)2
3.5	22635	3.5	23324	0.0024	0.0003	0.0019
3.5	22635	3.5	25758	0.0140	0.0132	0.1044
3.5	22635	3.5	26341	0.0832	0.0229	0.0342
3.5	22635	3.5	27168	0.0000	0.0011	0.0272
3.5	23324	3.5	23324	0.1552	0.0000	0.0060
3.5	23324	3.5	25758	0.0380	0.0006	0.0582
3.5	23324	3.5	26341	0.0103	0.0004	0.0040
3.5	23324	3.5	27168	0.0648	0.0009	0.0000
3.5	25758	3.5	25758	0.1512	0.0088	0.3551
3.5	25758	3.5	26341	0.0094	0.0112	0.0671
3.5	25758	3.5	27168	0.0025	0.0054	0.0019
3.5	26341	3.5	26341	0.0132	0.0001	0.0086
3.5	26341	3.5	27168	0.0001	0.0009	0.0000
3.5	27168	3.5	27168	0.0504	0.0013	0.0008
3.5	3327	4.5	6254	0.2267	0.1392	0.0002
3.5	3327	4.5	12306	0.0005	0.1559	0.3800
3.5	3327	4.5	17471	0.0015	0.0052	0.0627
3.5	3327	4.5	21797	0.0058	0.0007	0.0009
3.5	3327	4.5	23063	0.0006	0.0057	0.0017
3.5	3327	4.5	26072	0.0035	0.0003	0.0021
3.5	9572	4.5	6254	0.3366	0.0673	0.1731
3.5	9572	4.5	12306	0.0376	0.0053	0.0991
3.5	9572	4.5	17471	0.0001	0.0240	0.0103
3.5	9572	4.5	21797	0.0002	0.0009	0.0251
3.5	9572	4.5	23063	0.0076	0.0000	0.0362
3.5	9572	4.5	26072	0.0002	0.0108	0.0011
3.5	18307	4.5	6254	0.0019	0.0546	0.0349
3.5	18307	4.5	12306	0.0036	0.0000	0.0068
3.5	18307	4.5	17471	0.0277	0.0582	0.0953
3.5	18307	4.5	21797	0.0064	0.0150	0.0275
3.5	18307	4.5	23063	0.0151	0.0001	0.0741
3.5	18307	4.5	26072	0.0219	0.0814	0.0738
3.5	22635	4.5	6254	0.0056	0.0022	0.0133
3.5	22635	4.5	12306	0.0032	0.0029	0.0054
3.5	22635	4.5	17471	0.5437	0.0141	0.0082
3.5	22635	4.5	21797	0.0232	0.0393	0.0053
3.5	22635	4.5	23063	0.0000	0.0338	0.0605
3.5	22635	4.5	26072	0.0816	0.0002	0.0159
3.5	23324	4.5	6254	0.0006	0.0351	0.1437
3.5	23324	4.5	12306	0.3519	0.1301	0.0000
3.5	23324	4.5	17471	0.0051	0.0000	0.0010
3.5	23324	4.5	21797	0.0047	0.0735	0.0143
3.5	23324	4.5	23063	0.0064	0.0010	0.0342
3.5	23324	4.5	26072	0.0180	0.0036	0.0059
3.5	25758	4.5	6254	0.0005	0.0009	0.0181
3.5	25758	4.5	12306	0.0479	0.0426	0.0020
3.5	25758	4.5	17471	0.0006	0.0245	0.0343
3.5	25758	4.5	21797	0.1212	0.0057	0.0123
3.5	25758	4.5	23063	0.0075	0.0000	0.1798

Appendix XIV (Continued)

J1	LEVEL 1	J2	LEVEL 2	(U2)2	(U4)2	(U6)2
3.5	25758	4.5	26072	0.0312	0.0061	0.0205
3.5	26341	4.5	6254	0.0063	0.0153	0.0009
3.5	26341	4.5	12306	0.0307	0.0255	0.0002
3.5	26341	4.5	17471	0.0000	0.0194	0.0243
3.5	26341	4.5	21797	0.0382	0.1261	0.1033
3.5	26341	4.5	23063	0.0246	0.0068	0.0004
3.5	26341	4.5	26072	0.0455	0.0004	0.0036
3.5	27168	4.5	6254	0.0000	0.0036	0.0000
3.5	27168	4.5	12306	0.1173	0.0330	0.0206
3.5	27168	4.5	17471	0.0010	0.0013	0.2173
3.5	27168	4.5	21797	0.0128	0.0242	0.0574
3.5	27168	4.5	23063	0.0147	0.0456	0.0030
3.5	27168	4.5	26072	0.0000	0.0135	0.0098
3.5	3327	5.5	8783	0.0740	0.1889	0.1556
3.5	3327	5.5	14853	0.0001	0.0101	0.2163
3.5	3327	5.5	17714	0.0009	0.0000	0.1371
3.5	3327	5.5	23355	0.0001	0.0037	0.0030
3.5	3327	5.5	24699	0.0089	0.0001	0.0054
3.5	3327	5.5	27220	0.0009	0.0044	0.0001
3.5	9572	5.5	8783	0.3639	0.0125	0.2892
3.5	9572	5.5	14853	0.0039	0.0476	0.0420
3.5	9572	5.5	17714	0.0006	0.0002	0.0130
3.5	9572	5.5	23355	0.0004	0.0002	0.0100
3.5	9572	5.5	24699	0.0016	0.0072	0.0313
3.5	9572	5.5	27220	0.0013	0.0077	0.0284
3.5	18307	5.5	8783	0.0502	0.0082	0.0002
3.5	18307	5.5	14853	0.0098	0.0001	0.0000
3.5	18307	5.5	17714	0.0743	0.0481	0.1377
3.5	18307	5.5	23355	0.0027	0.0111	0.1509
3.5	18307	5.5	24699	0.0020	0.0021	0.0357
3.5	18307	5.5	27220	0.0184	0.0036	0.1301
3.5	22635	5.5	8783	0.0046	0.0014	0.0047
3.5	22635	5.5	14853	0.0262	0.0096	0.0153
3.5	22635	5.5	17714	0.1755	0.0758	0.0484
3.5	22635	5.5	23355	0.0141	0.0014	0.0275
3.5	22635	5.5	24699	0.0187	0.0514	0.1615
3.5	22635	5.5	27220	0.0069	0.0167	0.1663
3.5	23324	5.5	8783	0.0000	0.1170	0.2111
3.5	23324	5.5	14853	0.8694	0.0682	0.0002
3.5	23324	5.5	17714	0.0081	0.0104	0.0552
3.5	23324	5.5	23355	0.0163	0.0006	0.0250
3.5	23324	5.5	24699	0.0054	0.0005	0.0064
3.5	23324	5.5	27220	0.0013	0.0031	0.0215
3.5	25758	5.5	8783	0.0212	0.0421	0.0095
3.5	25758	5.5	14853	0.1781	0.0010	0.0003
3.5	25758	5.5	17714	0.0880	0.0020	0.0211
3.5	25758	5.5	23355	0.1174	0.0081	0.0000
3.5	25758	5.5	24699	0.1360	0.0015	0.0638
3.5	25758	5.5	27220	0.0058	0.0404	0.0556

Appendix XIV (Continued)

J1	LEVEL 1	J2	LEVEL 2	(U2)2	(U4)2	(U6)2
3.5	26341	5.5	8783	0.0129	0.0189	0.0185
3.5	26341	5.5	14853	0.1088	0.0241	0.0022
3.5	26341	5.5	17714	0.0192	0.0000	0.0651
3.5	26341	5.5	23355	0.0009	0.0037	0.0006
3.5	26341	5.5	24699	0.1879	0.0933	0.0041
3.5	26341	5.5	27220	0.0009	0.0040	0.0822
3.5	27168	5.5	8783	0.0099	0.0007	0.0017
3.5	27168	5.5	14853	0.1936	0.0113	0.0036
3.5	27168	5.5	17714	0.0453	0.0281	0.0586
3.5	27168	5.5	23355	0.0053	0.0505	0.0408
3.5	27168	5.5	24699	0.0013	0.0255	0.2000
3.5	27168	5.5	27220	0.0987	0.0006	0.0145
3.5	3327	6.5	10961	0.0	0.0083	0.2551
3.5	3327	6.5	17678	0.0	0.0000	0.0720
3.5	3327	6.5	23695	0.0	0.0010	0.0293
3.5	3327	6.5	25255	0.0	0.0000	0.0000
3.5	3327	6.5	25810	0.0	0.0001	0.0113
3.5	9572	6.5	10961	0.0	0.3088	0.0110
3.5	9572	6.5	17678	0.0	0.0801	0.0024
3.5	9572	6.5	23695	0.0	0.0152	0.0132
3.5	9572	6.5	25255	0.0	0.0031	0.0336
3.5	9572	6.5	25810	0.0	0.0009	0.0915
3.5	18307	6.5	10961	0.0	0.0508	0.0000
3.5	18307	6.5	17678	0.0	0.0323	0.0100
3.5	18307	6.5	23695	0.0	0.0376	0.2643
3.5	18307	6.5	25255	0.0	0.0125	0.0020
3.5	18307	6.5	25810	0.0	0.0498	0.1213
3.5	22635	6.5	10961	0.0	0.0105	0.0066
3.5	22635	6.5	17678	0.0	0.0127	0.0119
3.5	22635	6.5	23695	0.0	0.0048	0.0003
3.5	22635	6.5	25255	0.0	0.2160	0.1437
3.5	22635	6.5	25810	0.0	0.0002	0.0109
3.5	23324	6.5	10961	0.0	0.2693	0.1204
3.5	23324	6.5	17678	0.0	0.0151	0.0030
3.5	23324	6.5	23695	0.0	0.0031	0.0513
3.5	23324	6.5	25255	0.0	0.0114	0.1791
3.5	23324	6.5	25810	0.0	0.0076	0.0077
3.5	25758	6.5	10961	0.0	0.0410	0.0010
3.5	25758	6.5	17678	0.0	0.0000	0.0042
3.5	25758	6.5	23695	0.0	0.0298	0.2228
3.5	25758	6.5	25255	0.0	0.0046	0.0810
3.5	25758	6.5	25810	0.0	0.0530	0.0296
3.5	26341	6.5	10961	0.0	0.0177	0.0012
3.5	26341	6.5	17678	0.0	0.0411	0.0308
3.5	26341	6.5	23695	0.0	0.0472	0.0136
3.5	26341	6.5	25255	0.0	0.0873	0.0276
3.5	26341	6.5	25810	0.0	0.0196	0.1607
3.5	27168	6.5	10961	0.0	0.0159	0.0122
3.5	27168	6.5	17678	0.0	0.0741	0.0677

Appendix XIV (Continued)

J1	LEVEL 1	J2	LEVEL 2	(U2)2	(U4)2	(U6)2
3.5	27168	6.5	23695	0.0	0.0000	0.0013
3.5	27168	6.5	25255	0.0	0.0638	0.0484
3.5	27168	6.5	25810	0.0	0.0068	0.0024
3.5	3327	7.5	12515	0.0	0.0042	0.1253
3.5	3327	7.5	16449	0.0	0.0006	0.0242
3.5	3327	7.5	22451	0.0	0.0575	0.0918
3.5	3327	7.5	24060	0.0	0.0083	0.0000
3.5	9572	7.5	12515	0.0	0.1960	0.4589
3.5	9572	7.5	16449	0.0	0.0022	0.2023
3.5	9572	7.5	22451	0.0	0.0101	0.0235
3.5	9572	7.5	24060	0.0	0.0066	0.0114
3.5	18307	7.5	12515	0.0	0.0317	0.0014
3.5	18307	7.5	16449	0.0	0.1984	0.0007
3.5	18307	7.5	22451	0.0	0.1759	0.9005
3.5	18307	7.5	24060	0.0	0.0531	0.1382
3.5	22635	7.5	12515	0.0	0.0004	0.0974
3.5	22635	7.5	16449	0.0	0.2090	0.1905
3.5	22635	7.5	22451	0.0	0.3250	0.0392
3.5	22635	7.5	24060	0.0	0.0359	0.0194
3.5	23324	7.5	12515	0.0	0.4282	0.0121
3.5	23324	7.5	16449	0.0	0.0321	0.0032
3.5	23324	7.5	22451	0.0	0.0303	0.0079
3.5	23324	7.5	24060	0.0	0.0009	0.0084
3.5	25758	7.5	12515	0.0	0.0003	0.0000
3.5	25758	7.5	16449	0.0	0.1688	0.0241
3.5	25758	7.5	22451	0.0	0.0481	0.0129
3.5	25758	7.5	24060	0.0	0.0002	0.0000
3.5	26341	7.5	12515	0.0	0.0236	0.0155
3.5	26341	7.5	16449	0.0	0.0088	0.0001
3.5	26341	7.5	22451	0.0	0.0503	0.0000
3.5	26341	7.5	24060	0.0	0.2314	0.0189
3.5	27168	7.5	12515	0.0	0.0736	0.0269
3.5	27168	7.5	16449	0.0	0.0092	0.0236
3.5	27168	7.5	22451	0.0	0.0009	0.0218
3.5	27168	7.5	24060	0.0	0.0161	0.0312
3.5	3327	8.5	20775	0.0	0.0	0.1694
3.5	3327	8.5	25700	0.0	0.0	0.0030
3.5	9572	8.5	20775	0.0	0.0	0.1022
3.5	9572	8.5	25700	0.0	0.0	0.0070
3.5	18307	8.5	20775	0.0	0.0	0.2691
3.5	18307	8.5	25700	0.0	0.0	0.0004
3.5	22635	8.5	20775	0.0	0.0	0.0651
3.5	22635	8.5	25700	0.0	0.0	0.0001
3.5	23324	8.5	20775	0.0	0.0	0.0195
3.5	23324	8.5	25700	0.0	0.0	0.0049
3.5	25758	8.5	20775	0.0	0.0	0.3042
3.5	25758	8.5	25700	0.0	0.0	0.0439
3.5	26341	8.5	20775	0.0	0.0	0.1594
3.5	26341	8.5	25700	0.0	0.0	0.0514

Appendix XIV (Continued)

J1	LEVEL 1	J2	LEVEL 2	(U2)2	(U4)2	(U6)2
3.5	27168	8.5	20775	0.0	0.0	0.0000
3.5	27168	8.5	25700	0.0	0.0	0.0141
3.5	3327	9.5	23819	0.0	0.0	0.0097
3.5	9572	9.5	23819	0.0	0.0	0.1048
3.5	18307	9.5	23819	0.0	0.0	0.0062
3.5	22635	9.5	23819	0.0	0.0	0.0287
3.5	23324	9.5	23819	0.0	0.0	0.0482
3.5	25758	9.5	23819	0.0	0.0	0.4056
3.5	26341	9.5	23819	0.0	0.0	0.1842
3.5	27168	9.5	23819	0.0	0.0	0.1308
4.5	6254	4.5	6254	0.3355	0.0515	0.1586
4.5	6254	4.5	12306	0.0163	0.2706	0.1686
4.5	6254	4.5	17471	0.0055	0.0041	0.0059
4.5	6254	4.5	21797	0.0017	0.0213	0.0298
4.5	6254	4.5	23063	0.0014	0.0204	0.0387
4.5	6254	4.5	26072	0.0012	0.0063	0.0084
4.5	12306	4.5	12306	0.0543	0.0012	0.0858
4.5	12306	4.5	17471	0.0006	0.0145	0.0049
4.5	12306	4.5	21797	0.0418	0.0000	0.0000
4.5	12306	4.5	23063	0.0111	0.0035	0.0002
4.5	12306	4.5	26072	0.0149	0.0000	0.0090
4.5	17471	4.5	17471	0.1290	0.0037	0.0294
4.5	17471	4.5	21797	0.0227	0.0965	0.1177
4.5	17471	4.5	23063	0.0857	0.0000	0.0050
4.5	17471	4.5	26072	0.0020	0.1370	0.0008
4.5	21797	4.5	21797	0.0857	0.0281	0.1445
4.5	21797	4.5	23063	0.0289	0.0179	0.0102
4.5	21797	4.5	26072	0.0005	0.0409	0.0347
4.5	23063	4.5	23063	0.2341	0.0485	0.0876
4.5	23063	4.5	26072	0.0889	0.0066	0.0174
4.5	26072	4.5	26072	0.0292	0.0379	0.0047
4.5	6254	5.5	8783	0.3137	0.2235	0.0000
4.5	6254	5.5	14853	0.0001	0.0830	0.4449
4.5	6254	5.5	17714	0.0000	0.0053	0.0191
4.5	6254	5.5	23355	0.0004	0.0015	0.0405
4.5	6254	5.5	24699	0.0053	0.0010	0.0308
4.5	6254	5.5	27220	0.0002	0.0000	0.0082
4.5	12306	5.5	8783	0.2992	0.2207	0.0065
4.5	12306	5.5	14853	0.0325	0.0192	0.0054
4.5	12306	5.5	17714	0.0034	0.0470	0.0054
4.5	12306	5.5	23355	0.0017	0.0272	0.0185
4.5	12306	5.5	24699	0.0010	0.0105	0.0028
4.5	12306	5.5	27220	0.0036	0.0263	0.0193
4.5	17471	5.5	8783	0.0056	0.0030	0.0037
4.5	17471	5.5	14853	0.0026	0.0039	0.0328
4.5	17471	5.5	17714	0.2161	0.0453	0.1300
4.5	17471	5.5	23355	0.0091	0.2001	0.0418
4.5	17471	5.5	24699	0.0000	0.0891	0.0802
4.5	17471	5.5	27220	0.0004	0.1506	0.0029

Appendix XIV (Continued)

J1	LEVEL 1	J2	LEVEL 2	(U2)2	(U4)2	(U6)2
4.5	21797	5.5	8783	0.0049	0.0269	0.0031
4.5	21797	5.5	14853	0.0014	0.0015	0.0050
4.5	21797	5.5	17714	0.0281	0.0797	0.0012
4.5	21797	5.5	23355	0.0225	0.0796	0.0089
4.5	21797	5.5	24699	0.0226	0.0000	0.0347
4.5	21797	5.5	27220	0.0008	0.0082	0.0726
4.5	23063	5.5	8783	0.0002	0.0482	0.0000
4.5	23063	5.5	14853	0.0000	0.0629	0.0000
4.5	23063	5.5	17714	0.3375	0.1135	0.0015
4.5	23063	5.5	23355	0.0024	0.0283	0.0116
4.5	23063	5.5	24699	0.0015	0.0482	0.0014
4.5	23063	5.5	27220	0.0001	0.1191	0.0048
4.5	26072	5.5	8783	0.0366	0.0040	0.0000
4.5	26072	5.5	14853	0.0170	0.0019	0.0006
4.5	26072	5.5	17714	0.3307	0 0417	0.1674
4.5	26072	5.5	23355	0.1022	0.0062	0.0041
4.5	26072	5.5	24699	0.0163	0.0467	0.1218
4.5	26072	5.5	27220	0.0221	0.0003	0.0503
4.5	6254	6.5	10961	0.0578	0.1849	0.2210
4.5	6254	6.5	17678	0.0050	0.0020	0.1068
4.5	6254	6.5	23695	0.0049	0.0102	0.0638
4.5	6254	6.5	25255	0.0094	0.0026	0.0005
4.5	6254	6.5	25810	0.0004	0.0009	0.0013
4.5	12306	6.5	10961	0.6223	0.0243	0.3536
4.5	12306	6.5	17678	0.0105	0.0051	0.0577
4.5	12306	6.5	23695	0.0027	0.0000	0.0018
4.5	12306	6.5	25255	0.0000	0.0183	0.0032
4.5	12306	6.5	25810	0.0016	0.0228	0.0345
4.5	17471	6.5	10961	0.0000	0.0160	0.0209
4.5	17471	6.5	17678	0.0570	0.3493	0.3116
4.5	17471	6.5	23695	0.0068	0.1634	0.0036
4.5	17471	6.5	25255	0.0789	0.0115	0.2065
4.5	17471	6.5	25810	0.0018	0.0175	0.0205
4.5	21797	6.5	10961	0.0052	0.0007	0.0189
4.5	21797	6.5	17678	0.0578	0.0220	0.0813
4.5	21797	6.5	23695	0.0000	0.0000	0.2659
4.5	21797	6.5	25255	0.0902	0.0034	0.0000
4.5	21797	6.5	25810	0.0101	0.0051	0.1680
4.5	23063	6.5	10961	0.0000	0.0011	0.0626
4.5	23063	6.5	17678	0.2303	0.0318	0.1790
4.5	23063	6.5	23695	0.0000	0.0371	0.1221
4.5	23063	6.5	25255	0.0991	0.0452	0.0366
4.5	23063	6.5	25810	0.0262	0.0979	0.0177
4.5	26072	6.5	10961	0.0240	0.0666	0.0031
4.5	26072	6.5	17678	0.1438	0.1245	0.0108
4.5	26072	6.5	23695	0.0117	0.1610	0.0187
4.5	26072	6.5	25255	0.0939	0.0214	0.0100
4.5	26072	6.5	25810	0.0526	0.1295	0.0287
4.5	6254	7.5	12515	0.0	0.0007	0.1470

Appendix XIV (Continued)

J1	LEVEL 1	J2	LEVEL 2	(U2)2	(U4)2	(U6)2
4.5	6254	7.5	16449	0.0	0.0100	0.1779
4.5	6254	7.5	22451	0.0	0.0010	0.0434
4.5	6254	7.5	24060	0.0	0.0001	0.0075
4.5	12306	7.5	12515	0.0	0.4170	0.4215
4.5	12306	7.5	16449	0.0	0.1070	0.0947
4.5	12306	7.5	22451	0.0	0.0489	0.0460
4.5	12306	7.5	24060	0.0	0.0029	0.0592
4.5	17471	7.5	12515	0.0	0.0019	0.1721
4.5	17471	7.5	16449	0.0	0.0636	0.5421
4.5	17471	7.5	22451	0.0	0.0538	0.0182
4.5	17471	7.5	24060	0.0	0.0078	0.3581
4.5	21797	7.5	12515	0.0	0.0184	0.0053
4.5	21797	7.5	16449	0.0	0.0312	0.0081
4.5	21797	7.5	22451	0.0	0.0606	0.0026
4.5	21797	7.5	24060	0.0	0.0651	0.0658
4.5	23063	7.5	12515	0.0	0.0079	0.0165
4.5	23063	7.5	16449	0.0	0.0379	0.2920
4.5	23063	7.5	22451	0.0	0.0049	0.0919
4.5	23063	7.5	24060	0.0	0.2375	0.0223
4.5	26072	7.5	12515	0.0	0.0056	0.0286
4.5	26072	7.5	16449	0.0	0.0473	0.0000
4.5	26072	7.5	22451	0.0	0.0598	0.0018
4.5	26072	7.5	24060	0.0	0.0559	0.2262
4.5	6254	8.5	20775	0.0	0.0001	0.0092
4.5	6254	8.5	25700	0.0	0.0338	0.0302
4.5	12306	8.5	20775	0.0	0.0006	0.0365
4.5	12306	8.5	25700	0.0	0.0005	0.0531
4.5	17471	8.5	20775	0.0	0.0453	0.4006
4.5	17471	8.5	25700	0.0	0.0004	0.0063
4.5	21797	8.5	20775	0.0	0.5495	0.0051
4.5	21797	8.5	25700	0.0	0.0877	0.4458
4.5	23063	8.5	20775	0.0	0.0218	0.0319
4.5	23063	8.5	25700	0.0	0.0315	0.1762
4.5	26072	8.5	20775	0.0	0.0169	0.0419
4.5	26072	8.5	25700	0.0	0.4001	0.0003
4.5	6254	9.5	23819	0.0	0.0	0.0850
4.5	12306	9.5	23819	0.0	0.0	0.1298
4.5	17471	9.5	23819	0.0	0.0	0.0145
4.5	21797	9.5	23819	0.0	0.0	0.0009
4.5	23063	9.5	23819	0.0	0.0	0.3830
4.5	26072	9.5	23819	0.0	0.0	0.4931
4.5	6254	10.5	25617	0.0	0.0	0.0037
4.5	12306	10.5	25617	0.0	0.0	0.0771
4.5	17471	10.5	25617	0.0	0.0	0.0000
4.5	21797	10.5	25617	0.0	0.0	0.0136
4.5	23063	10.5	25617	0.0	0.0	0.1356
4.5	26072	10.5	25617	0.0	0.0	0.0060
5.5	8783	5.5	8783	0.4123	0.0090	0.1514
5.5	8783	5.5	14853	0.0028	0.2154	0.6291

Appendix XIV (Continued)

J1	LEVEL 1	J2	LEVEL 2	(U2)2	(U4)2	(U6)2
5.5	8783	5.5	17714	0.0267	0.0003	0.0205
5.5	8783	5.5	23355	0.0091	0.0079	0.1252
5.5	8783	5.5	24699	0.0030	0.0081	0.0019
5.5	8783	5.5	27220	0.0001	0.0434	0.0293
5.5	14853	5.5	14853	0.2342	0.0469	0.0015
5.5	14853	5.5	17714	0.0000	0.0019	0.0228
5.5	14853	5.5	23355	0.0369	0.0043	0.0020
5.5	14853	5.5	24699	0.0002	0.0010	0.0404
5.5	14853	5.5	27220	0.0171	0.0063	0.0135
5.5	17714	5.5	17714	0.0462	0.1027	0.4059
5.5	17714	5.5	23355	0.0623	0.1533	0.2101
5.5	17714	5.5	24699	0.0064	0.0755	0.0342
5.5	17714	5.5	27220	0.0182	0.0608	0.0320
5.5	23355	5.5	23355	0.0229	0.0502	0.1671
5.5	23355	5.5	24699	0.0024	0.0783	0.0141
5.5	23355	5.5	27220	0.2764	0.0297	0.0005
5.5	24699	5.5	24699	0.1039	0.0000	0.1308
5.5	24699	5.5	27220	0.0137	0.0018	0.0593
5.5	27220	5.5	27220	0.1333	0.0094	0.0175
5.5	8783	6.5	10961	0.3619	0.3326	0.0625
5.5	8783	6.5	17678	0.0013	0.0339	0.0049
5.5	8783	6.5	23695	0.0014	0.0004	0.0296
5.5	8783	6.5	25255	0.0079	0.0000	0.0155
5.5	8783	6.5	25810	0.0019	0.0109	0.0506
5.5	14853	6.5	10961	0.1734	0.3974	0.5114
5.5	14853	6.5	17678	0.0144	0.0271	0.0477
5.5	14853	6.5	23695	0.0016	0.0067	0.0082
5.5	14853	6.5	25255	0.0011	0.0009	0.0713
5.5	14853	6.5	25810	0.0000	0.0240	0.0001
5.5	17714	6.5	10961	0.0204	0.0135	0.0406
5.5	17714	6.5	17678	0.5753	0.0680	0.3317
5.5	17714	6.5	23695	0.0003	0.0450	0.0028
5.5	17714	6.5	25255	0.0041	0.0671	0.0081
5.5	17714	6.5	25810	0.0143	0.0274	0.1483
5.5	23355	6.5	10961	0.0409	0.0010	0.0195
5.5	23355	6.5	17678	0.0005	0.1202	0.0956
5.5	23355	6.5	23695	0.0776	0.0969	0.0221
5.5	23355	6.5	25255	0.0445	0.0000	0.0729
5.5	23355	6.5	25810	0.0000	0.0013	0.0669
5.5	24699	6.5	10961	0.0009	0.0038	0.0385
5.5	24699	6.5	17678	0.0896	0.0469	0.0293
5.5	24699	6.5	23695	0.2394	0.0900	0.3005
5.5	24699	6.5	25255	0.0564	0.1218	0.0002
5.5	24699	6.5	25810	0.0086	0.0336	0.0407
5.5	27220	6.5	10961	0.0320	0.0555	0.0107
5.5	27220	6.5	17678	0.3413	0.0218	0.1977
5.5	27220	6.5	23695	0.0741	0.0019	0.0010
5.5	27220	6.5	25255	0.0309	0.0307	0.0094
5.5	27220	6.5	25810	0.0000	0.0049	0.0066

Appendix XIV (Continued)

J1	LEVEL 1	J2	LEVEL 2	(U2)2	(U4)2	(U6)2
5.5	8783	7.5	12515	0.0270	0.1314	0.3374
5.5	8783	7.5	16449	0.0040	0.0084	0.0476
5.5	8783	7.5	22451	0.0037	0.0024	0.1755
5.5	8783	7.5	24060	0.0002	0.0347	0 0340
5.5	14853	7.5	12515	0.8665	0.4691	0.1866
5.5	14853	7.5	16449	0.1005	0.1582	0.0319
5.5	14853	7.5	22451	0.0070	0.0026	0.0002
5.5	14853	7.5	24060	0.0067	0.0521	0.0337
5.5	17714	7.5	12515	0.0001	0.1513	0.0091
5.5	17714	7.5	16449	0.0432	0.7064	0.0284
5.5	17714	7.5	22451	0.0127	0.0170	0.0410
5.5	17714	7.5	24060	0.0153	0.0983	0.1408
5.5	23355	7.5	12515	0.0000	0.0058	0.0146
5.5	23355	7.5	16449	0.0083	0.0559	0.0479
5.5	23355	7.5	22451	0.0444	0.0108	0.0580
5.5	23355	7.5	24060	0.2689	0.0511	0.0300
5.5	24699	7.5	12515	0.0018	0.0041	0.0135
5.5	24699	7.5	16449	0.0090	0.1119	0.1836
5.5	24699	7.5	22451	0.0361	0.1795	0.5102
5.5	24699	7.5	24060	0.0008	0.0005	0.0271
5.5	27220	7.5	12515	0.1190	0.0008	0.0001
5.5	27220	7.5	16449	0.5865	0.0199	0.0015
5.5	27220	7.5	22451	0.0592	0.2853	0.1862
5.5	27220	7.5	24060	0.1188	0.0147	0.0002
5.5	8783	8.5	20775	0.0	0.0101	0.1780
5.5	8783	8.5	25700	0.0	0.0023	0.0361
5.5	14853	8.5	20775	0.0	0.0078	0.0095
5.5	14853	8.5	25700	0.0	0.0010	0.0286
5.5	17714	8.5	20775	0.0	0.0393	0.6519
5.5	17714	8.5	25700	0.0	0.0042	0.1005
5.5	23355	8.5	20775	0.0	0.0908	0.0774
5.5	23355	8.5	25700	0.0	0.0664	0.0153
5.5	24699	8.5	20775	0.0	0.0898	0.3161
5.5	24699	8.5	25700	0.0	0.1167	0.0255
5.5	27220	8.5	20775	0.0	0.1676	0.1013
5.5	27220	8.5	25700	0.0	0.0227	0.0177
5.5	8783	9.5	23819	0.0	0.0160	0.0223
5.5	14853	9.5	23819	0.0	0.0172	0.0122
5.5	17714	9.5	23819	0.0	0.0643	0.1755
5.5	23355	9.5	23819	0.0	0.5820	0.0737
5.5	24699	9.5	23819	0.0	0.0027	0.1225
5.5	27220	9.5	23819	0.0	0.0275	0.0028
5.5	8783	10.5	25617	0.0	0.0	0.0388
5.5	14853	10.5	25617	0.0	0.0	0.1765
5.5	17714	10.5	25617	0.0	0.0	0.0153
5.5	23355	10.5	25617	0.0	0.0	0.3179
5.5	24699	10.5	25617	0.0	0.0	0.0000
5.5	27220	10.5	25617	0.0	0.0	0.5003
6.5	10961	6.5	10961	0.5528	0.0447	0.0783

Appendix XIV (Continued)

J1	LEVEL 1	J2	LEVEL 2	(U2)2	(U4)2	(U6)2
6.5	10961	6.5	17678	0.0656	0.0136	0.0023
6.5	10961	6.5	23695	0.0126	0.0012	0.1155
6.5	10961	6.5	25255	0.0012	0.0435	0.0000
6.5	10961	6.5	25810	0.0081	0.0541	0.0797
6.5	17678	6.5	17678	0.0021	0.0826	0.0300
6.5	17678	6.5	23695	0.0174	0.0197	0.1669
6.5	17678	6.5	25255	0.0656	0.2912	0.0097
6.5	17678	6.5	25810	0.0000	0.0377	0.2672
6.5	23695	6.5	23695	0.1077	0.0009	0.1352
6.5	23695	6.5	25255	0.0029	0.0436	0.0518
6.5	23695	6.5	25810	0.0106	0.1145	0.0125
6.5	25255	6.5	25255	0.0355	0.0960	0.0365
6.5	25255	6.5	25810	0.0398	0.0763	0.0853
6.5	25810	6.5	25810	0.0056	0.0392	0.1316
6.5	10961	7.5	12515	0.3187	0.2585	0.3275
6.5	10961	7.5	16449	0.0000	0.1569	0.1858
6.5	10961	7.5	22451	0.0103	0.0062	0.0332
6.5	10961	7.5	24060	0.0063	0.0003	0.1309
6.5	17678	7.5	12515	0.0633	0.0399	0.0961
6.5	17678	7.5	16449	0.7685	0.0733	0.1650
6.5	17678	7.5	22451	0.0086	0.0759	0.4904
6.5	17678	7.5	24060	0.0345	0.1536	0.0332
6.5	23695	7.5	12515	0.0050	0.0010	0.1428
6.5	23695	7.5	16449	0.0955	0.0030	0.7766
6.5	23695	7.5	22451	0.6085	0.0595	0.0167
6.5	23695	7.5	24060	0.0035	0.0179	0.0186
6.5	25255	7.5	12515	0.0274	0.0029	0.2800
6.5	25255	7.5	16449	0.0421	0.0024	0.1113
6.5	25255	7.5	22451	0.0945	0.2543	0.0020
6.5	25255	7.5	24060	0.1626	0.0589	0.1349
6.5	25810	7.5	12515	0.1922	0.0562	0.0026
6.5	25810	7.5	16449	0.0265	0.1206	0.0151
6.5	25810	7.5	22451	0.1108	0.0656	0.1336
6.5	25810	7.5	24060	0.4533	0.0046	0.0076
6.5	10961	8.5	20775	0.0002	0.1145	0.0012
6.5	10961	8.5	25700	0.0034	0.0442	0.1234
6.5	17678	8.5	20775	0.0215	0.1992	0.3079
6.5	17678	8.5	25700	0.0089	0.0145	0.0187
6.5	23695	8.5	20775	0.0157	0.6586	0.1614
6.5	23695	8.5	25700	0.0446	0.0187	0.0506
6.5	25255	8.5	20775	0.0178	0.0208	0.0812
6.5	25255	8.5	25700	0.0313	0.3169	0.2052
6.5	25810	8.5	20775	0.1582	0.0160	0.0180
6.5	25810	8.5	25700	0.0339	0.0382	0.2675
6.5	10961	9.5	23819	0.0	0.0097	0.4117
6.5	17678	9.5	23819	0.0	0.0173	0.6843
6.5	23695	9.5	23819	0.0	0.1401	0.0873
6.5	25255	9.5	23819	0.0	0.0625	0.1785
6.5	25810	9.5	23819	0.0	0.2601	0.2917

Appendix XIV (Continued)

J1	LEVEL 1	J2	LEVEL 2	(U2)2	(U4)2	(U6)2
6.5	10961	10.5	25617	0.0	0.0544	0.0320
6.5	17678	10.5	25617	0.0	0.0352	0.1187
6.5	23695	10.5	25617	0.0	0.0122	0.0049
6.5	25255	10.5	25617	0.0	0.0581	0.2453
6.5	25810	10.5	25617	0.0	0.7367	0.0937
7.5	12515	7.5	12515	0.5139	0.7170	0.2298
7.5	12515	7.5	16449	0.3176	0.0088	0.0345
7.5	12515	7.5	22451	0.0187	0.0371	0.0148
7.5	12515	7.5	24060	0.0196	0.0337	0.0201
7.5	16449	7.5	16449	0.0631	0.9310	0.0016
7.5	16449	7.5	22451	0.0359	0.0898	0.3333
7.5	16449	7.5	24060	0.2141	0.0424	0.0003
7.5	22451	7.5	22451	0.0008	0.0351	0.1763
7.5	22451	7.5	24060	0.0108	0.2832	0.0049
7.5	24060	7.5	24060	0.0006	0.5411	0.0699
7.5	12515	8.5	20775	0.0482	0.0330	0.0733
7.5	12515	8.5	25700	0.0004	0.0249	0.5008
7.5	16449	8.5	20775	0.0508	0.0155	0.1946
7.5	16449	8.5	25700	0.0011	0.0155	0.6726
7.5	22451	8.5	20775	0.7700	0.4290	0.0035
7.5	22451	8.5	25700	0.0166	0.0778	0.0056
7.5	24060	8.5	20775	0.1745	0.0513	0.0064
7.5	24060	8.5	25700	0.0012	0.0747	0.1638
7.5	12515	9.5	23819	0.0307	0.3091	0.0184
7.5	16449	9.5	23819	0.0172	0.1106	0.2175
7.5	22451	9.5	23819	0.0617	0.1424	0.2957
7.5	24060	9.5	23819	0.0340	0.2343	0.2773
7.5	12515	10.5	25617	0.0	0.0095	0.9103
7.5	16449	10.5	25617	0.0	0.0031	0.2792
7.5	22451	10.5	25617	0.0	0.0628	0.1971
7.5	24060	10.5	25617	0.0	0.0410	0.6322
8.5	20775	8.5	20775	0.4983	0.6058	0.0361
8.5	20775	8.5	25700	0.0000	0.1960	0.3291
8.5	25700	8.5	25700	0.0018	0.2170	0.1118
8.5	20775	9.5	23819	0.1747	0.0113	0.2142
8.5	25700	9.5	23819	0.8155	0.2924	0.1023
8.5	20775	10.5	25617	0.0087	0.1976	0.4614
8.5	25700	10.5	25617	0.0923	0.1870	0.1587
9.5	23819	9.5	23819	0.7351	0.3611	0.0276
9.5	23819	10.5	25617	0.2268	0.0355	0.3908
10.5	25617	10.5	25617	1.0900	0.3294	0.5774

Appendix XV
Matrix Elements of (Uλ)2 for Am^{3+}:$LaCl_3$ with Ground State, J1 = 0.0

J2	LEVEL	(U2)2	(U4)2	(U6)2
1.0	2760	0.0	0.0	0.0
2.0	5350	0.0961	0.0	0.0
3.0	7590	0.0	0.0	0.0
4.0	9544	0.0	0.1274	0.0
5.0	11191	0.0	0.0	0.0
0.0	12326	0.0	0.0	0.0
6.0	12329	0.0	0.0	0.2238
1.0	17271	0.0	0.0	0.0
6.0	19602	0.0	0.0	0.1940
2.0	21709	0.0065	0.0	0.0
2.0	21961	0.0112	0.0	0.0
3.0	22649	0.0	0.0	0.0
5.0	23349	0.0	0.0	0.0
4.0	23640	0.0	0.0736	0.0
7.0	24047	0.0	0.0	0.0
6.0	24758	0.0	0.0	0.0033
3.0	25281	0.0	0.0	0.0
4.0	26552	0.0	0.0395	0.0
8.0	26782	0.0	0.0	0.0
2.0	27283	0.0057	0.0	0.0
5.0	27608	0.0	0.0	0.0
0.0	27667	0.0	0.0	0.0
3.0	27968	0.0	0.0	0.0
10.0	28399	0.0	0.0	0.0
9.0	28441	0.0	0.0	0.0
7.0	28896	0.0	0.0	0.0
3.0	29265	0.0	0.0	0.0
4.0	29445	0.0	0.0017	0.0
6.0	29586	0.0	0.0	0.0106
5.0	29654	0.0	0.0	0.0
1.0	29673	0.0	0.0	0.0
5.0	29905	0.0	0.0	0.0
4.0	29928	0.0	0.0000	0.0
2.0	31121	0.0005	0.0	0.0
4.0	31684	0.0	0.0001	0.0
3.0	32147	0.0	0.0	0.0
6.0	32254	0.0	0.0	0.0002
2.0	32697	0.0024	0.0	0.0
8.0	32715	0.0	0.0	0.0
6.0	32844	0.0	0.0	0.0000
7.0	32922	0.0	0.0	0.0
8.0	33422	0.0	0.0	0.0
5.0	33487	0.0	0.0	0.0
3.0	33981	0.0	0.0	0.0
4.0	34067	0.0	0.0078	0.0
6.0	34661	0.0	0.0	0.0014
5.0	34753	0.0	0.0	0.0

Appendix XV (Continued)

J2	LEVEL	(U2)2	(U4)2	(U6)2
1.0	34790	0.0	0.0	0.0
6.0	34974	0.0	0.0	0.0004
10.0	35371	0.0	0.0	0.0
1.0	35844	0.0	0.0	0.0
7.0	36295	0.0	0.0	0.0
4.0	36759	0.0	0.0043	0.0

Appendix XV (Continued)
Matrix Elements of (Uλ)2 for Am^{3+}:$LaCl_3$ (to 37000 cm^{-1})

J1	LEVEL 1	J2	LEVEL 2	(U2)2	(U4)2	(U6)2
0.0	-16	2.0	5350	0.0961	0.0	0.0
0.0	-16	2.0	21709	0.0065	0.0	0.0
0.0	-16	2.0	21961	0.0112	0.0	0.0
0.0	-16	2.0	27283	0.0057	0.0	0.0
0.0	-16	2.0	31121	0.0005	0.0	0.0
0.0	-16	2.0	32697	0.0024	0.0	0.0
0.0	12326	2.0	5350	0.0328	0.0	0.0
0.0	12326	2.0	21709	0.0015	0.0	0.0
0.0	12326	2.0	21961	0.0592	0.0	0.0
0.0	12326	2.0	27283	0.0226	0.0	0.0
0.0	12326	2.0	31121	0.0005	0.0	0.0
0.0	12326	2.0	32697	0.0022	0.0	0.0
0.0	27667	2.0	5350	0.0043	0.0	0.0
0.0	27667	2.0	21709	0.0025	0.0	0.0
0.0	27667	2.0	21961	0.0013	0.0	0.0
0.0	27667	2.0	27283	0.0018	0.0	0.0
0.0	27667	2.0	31121	0.0212	0.0	0.0
0.0	27667	2.0	32697	0.0746	0.0	0.0
0.0	-16	4.0	9544	0.0	0.1274	0.0
0.0	-16	4.0	23640	0.0	0.0736	0.0
0.0	-16	4.0	26552	0.0	0.0395	0.0
0.0	-16	4.0	29445	0.0	0.0017	0.0
0.0	-16	4.0	29928	0.0	0.0000	0.0
0.0	-16	4.0	31684	0.0	0.0001	0.0
0.0	-16	4.0	34067	0.0	0.0078	0.0
0.0	-16	4.0	36759	0.0	0.0043	0.0
0.0	12326	4.0	9544	0.0	0.0218	0.0
0.0	12326	4.0	23640	0.0	0.1396	0.0
0.0	12326	4.0	26552	0.0	0.0577	0.0
0.0	12326	4.0	29445	0.0	0.0013	0.0
0.0	12326	4.0	29928	0.0	0.0033	0.0
0.0	12326	4.0	31684	0.0	0.0094	0.0
0.0	12326	4.0	34067	0.0	0.0002	0.0
0.0	12326	4.0	36759	0.0	0.0109	0.0
0.0	27667	4.0	9544	0.0	0.0000	0.0
0.0	27667	4.0	23640	0.0	0.0279	0.0
0.0	27667	4.0	26552	0.0	0.0108	0.0
0.0	27667	4.0	29445	0.0	0.0236	0.0
0.0	27667	4.0	29928	0.0	0.0399	0.0
0.0	27667	4.0	31684	0.0	0.0070	0.0
0.0	27667	4.0	34067	0.0	0.0004	0.0
0.0	27667	4.0	36759	0.0	0.0380	0.0
0.0	-16	6.0	12329	0.0	0.0	0.2238
0.0	-16	6.0	19602	0.0	0.0	0.1940
0.0	-16	6.0	24758	0.0	0.0	0.0033
0.0	-16	6.0	29586	0.0	0.0	0.0106

Appendix XV (Continued)

J1	LEVEL 1	J2	LEVEL 2	(U2)2	(U4)2	(U6)2
0.0	-16	6.0	32254	0.0	0.0	0.0002
0.0	-16	6.0	32844	0.0	0.0	0.0000
0.0	-16	6.0	34661	0.0	0.0	0.0014
0.0	-16	6.0	34974	0.0	0.0	0.0004
0.0	12326	6.0	12329	0.0	0.0	0.0003
0.0	12326	6.0	19602	0.0	0.0	0.3760
0.0	12326	6.0	24758	0.0	0.0	0.0648
0.0	12326	6.0	29586	0.0	0.0	0.0119
0.0	12326	6.0	32254	0.0	0.0	0.0077
0.0	12326	6.0	32844	0.0	0.0	0.0029
0.0	12326	6.0	34661	0.0	0.0	0.0184
0.0	12326	6.0	34974	0.0	0.0	0.0105
0.0	27667	6.0	12329	0.0	0.0	0.0031
0.0	27667	6.0	19602	0.0	0.0	0.0287
0.0	27667	6.0	24758	0.0	0.0	0.0010
0.0	27667	6.0	29586	0.0	0.0	0.0499
0.0	27667	6.0	32254	0.0	0.0	0.0612
0.0	27667	6.0	32844	0.0	0.0	0.0061
0.0	27667	6.0	34661	0.0	0.0	0.0915
0.0	27667	6.0	34974	0.0	0.0	0.2823
1.0	2760	1.0	2760	0.1117	0.0	0.0
1.0	2760	1.0	17271	0.0200	0.0	0.0
1.0	2760	1.0	29673	0.0057	0.0	0.0
1.0	2760	1.0	34790	0.0004	0.0	0.0
1.0	2760	1.0	35844	0.0027	0.0	0.0
1.0	17271	1.0	17271	0.0152	0.0	0.0
1.0	17271	1.0	29673	0.0149	0.0	0.0
1.0	17271	1.0	34790	0.0039	0.0	0.0
1.0	17271	1.0	35844	0.0041	0.0	0.0
1.0	29673	1.0	29673	0.0434	0.0	0.0
1.0	29673	1.0	34790	0.0394	0.0	0.0
1.0	29673	1.0	35844	0.1046	0.0	0.0
1.0	34790	1.0	34790	0.0054	0.0	0.0
1.0	34790	1.0	35844	0.0021	0.0	0.0
1.0	35844	1.0	35844	0.1004	0.0	0.0
1.0	2760	2.0	5350	0.0428	0.0	0.0
1.0	2760	2.0	21709	0.0000	0.0	0.0
1.0	2760	2.0	21961	0.0030	0.0	0.0
1.0	2760	2.0	27283	0.0106	0.0	0.0
1.0	2760	2.0	31121	0.0010	0.0	0.0
1.0	2760	2.0	32697	0.0050	0.0	0.0
1.0	17271	2.0	5350	0.0057	0.0	0.0
1.0	17271	2.0	21709	0.0166	0.0	0.0
1.0	17271	2.0	21961	0.0014	0.0	0.0
1.0	17271	2.0	27283	0.0899	0.0	0.0
1.0	17271	2.0	31121	0.0268	0.0	0.0
1.0	17271	2.0	32697	0.0302	0.0	0.0
1.0	29673	2.0	5350	0.0002	0.0	0.0
1.0	29673	2.0	21709	0.0183	0.0	0.0

Appendix XV (Continued)

J1	LEVEL 1	J2	LEVEL 2	(U2)2	(U4)2	(U6)2
1.0	29673	2.0	21961	0.0384	0.0	0.0
1.0	29673	2.0	27283	0.0340	0.0	0.0
1.0	29673	2.0	31121	0.0928	0.0	0.0
1.0	29673	2.0	32697	0.0352	0.0	0.0
1.0	34790	2.0	5350	0.0005	0.0	0.0
1.0	34790	2.0	21709	0.0000	0.0	0.0
1.0	34790	2.0	21961	0.0058	0.0	0.0
1.0	34790	2.0	27283	0.0000	0.0	0.0
1.0	34790	2.0	31121	0.0753	0.0	0.0
1.0	34790	2.0	32697	0.0014	0.0	0.0
1.0	35844	2.0	5350	0.0075	0.0	0.0
1.0	35844	2.0	21709	0.0226	0.0	0.0
1.0	35844	2.0	21961	0.0002	0.0	0.0
1.0	35844	2.0	27283	0.0043	0.0	0.0
1.0	35844	2.0	31121	0.0681	0.0	0.0
1.0	35844	2.0	32697	0.0250	0.0	0.0
1.0	2760	3.0	7590	0.1815	0.1195	0.0
1.0	2760	3.0	22649	0.0002	0.0269	0.0
1.0	2760	3.0	25281	0.0001	0.0123	0.0
1.0	2760	3.0	27968	0.0000	0.0049	0.0
1.0	2760	3.0	29265	0.0057	0.0000	0.0
1.0	2760	3.0	32147	0.0014	0.0326	0.0
1.0	2760	3.0	33981	0.0001	0.0020	0.0
1.0	17271	3.0	7590	0.0249	0.0088	0.0
1.0	17271	3.0	22649	0.0405	0.1726	0.0
1.0	17271	3.0	25281	0.0112	0.0334	0.0
1.0	17271	3.0	27968	0.0237	0.0003	0.0
1.0	17271	3.0	29265	0.0057	0.0027	0.0
1.0	17271	3.0	32147	0.0030	0.0241	0.0
1.0	17271	3.0	33981	0.0034	0.0201	0.0
1.0	29673	3.0	7590	0.0000	0.0000	0.0
1.0	29673	3.0	22649	0.0000	0.0042	0.0
1.0	29673	3.0	25281	0.0041	0.0211	0.0
1.0	29673	3.0	27968	0.0009	0.0099	0.0
1.0	29673	3.0	29265	0.2316	0.0009	0.0
1.0	29673	3.0	32147	0.0019	0.1299	0.0
1.0	29673	3.0	33981	0.0242	0.0619	0.0
1.0	34790	3.0	7590	0.0038	0.0004	0.0
1.0	34790	3.0	22649	0.0051	0.0096	0.0
1.0	34790	3.0	25281	0.0003	0.0191	0.0
1.0	34790	3.0	27968	0.0178	0.0054	0.0
1.0	34790	3.0	29265	0.0002	0.0138	0.0
1.0	34790	3.0	32147	0.0694	0.0059	0.0
1.0	34790	3.0	33981	0.0437	0.0067	0.0
1.0	35844	3.0	7590	0.0007	0.0006	0.0
1.0	35844	3.0	22649	0.0000	0.0146	0.0
1.0	35844	3.0	25281	0.0048	0.0045	0.0
1.0	35844	3.0	27968	0.0010	0.0429	0.0
1.0	35844	3.0	29265	0.0013	0.0451	0.0

Appendix XV (Continued)

J1	LEVEL 1	J2	LEVEL 2	(U2)2	(U4)2	(U6)2
1.0	35844	3.0	32147	0.0698	0.0179	0.0
1.0	35844	3.0	33981	0.0991	0.0386	0.0
1.0	2760	4.0	9544	0.0	0.1501	0.0
1.0	2760	4.0	23640	0.0	0.0072	0.0
1.0	2760	4.0	26552	0.0	0.0056	0.0
1.0	2760	4.0	29445	0.0	0.0162	0.0
1.0	2760	4.0	29928	0.0	0.0004	0.0
1.0	2760	4.0	31684	0.0	0.0031	0.0
1.0	2760	4.0	34067	0.0	0.0066	0.0
1.0	2760	4.0	36759	0.0	0.0006	0.0
1.0	17271	4.0	9544	0.0	0.0155	0.0
1.0	17271	4.0	23640	0.0	0.0009	0.0
1.0	17271	4.0	26552	0.0	0.0617	0.0
1.0	17271	4.0	29445	0.0	0.0791	0.0
1.0	17271	4.0	29928	0.0	0.0036	0.0
1.0	17271	4.0	31684	0.0	0.0545	0.0
1.0	17271	4.0	34067	0.0	0.0660	0.0
1.0	17271	4.0	36759	0.0	0.0225	0.0
1.0	29673	4.0	9544	0.0	0.0003	0.0
1.0	29673	4.0	23640	0.0	0.0635	0.0
1.0	29673	4.0	26552	0.0	0.0312	0.0
1.0	29673	4.0	29445	0.0	0.0007	0.0
1.0	29673	4.0	29928	0.0	0.0343	0.0
1.0	29673	4.0	31684	0.0	0.0076	0.0
1.0	29673	4.0	34067	0.0	0.0037	0.0
1.0	29673	4.0	36759	0.0	0.0111	0.0
1.0	34790	4.0	9544	0.0	0.0005	0.0
1.0	34790	4.0	23640	0.0	0.0004	0.0
1.0	34790	4.0	26552	0.0	0.0391	0.0
1.0	34790	4.0	29445	0.0	0.0003	0.0
1.0	34790	4.0	29928	0.0	0.0158	0.0
1.0	34790	4.0	31684	0.0	0.0015	0.0
1.0	34790	4.0	34067	0.0	0.0156	0.0
1.0	34790	4.0	36759	0.0	0.0172	0.0
1.0	35844	4.0	9544	0.0	0.0040	0.0
1.0	35844	4.0	23640	0.0	0.0026	0.0
1.0	35844	4.0	26552	0.0	0.0040	0.0
1.0	35844	4.0	29445	0.0	0.0246	0.0
1.0	35844	4.0	29928	0.0	0.0001	0.0
1.0	35844	4.0	31684	0.0	0.0033	0.0
1.0	35844	4.0	34067	0.0	0.1497	0.0
1.0	35844	4.0	36759	0.0	0.0183	0.0
1.0	2760	5.0	11191	0.0	0.1304	0.0708
1.0	2760	5.0	23349	0.0	0.0053	0.1040
1.0	2760	5.0	27608	0.0	0.0187	0.0093
1.0	2760	5.0	29654	0.0	0.0119	0.0175
1.0	2760	5.0	29905	0.0	0.0391	0.0046
1.0	2760	5.0	33487	0.0	0.0057	0.0000
1.0	2760	5.0	34753	0.0	0.0120	0.0010

Appendix XV (Continued)

J1	LEVEL 1	J2	LEVEL 2	(U2)2	(U4)2	(U6)2
1.0	17271	5.0	11191	0.0	0.0019	0.0007
1.0	17271	5.0	23349	0.0	0.1000	0.2628
1.0	17271	5.0	27608	0.0	0.1238	0.0003
1.0	17271	5.0	29654	0.0	0.0258	0.0011
1.0	17271	5.0	29905	0.0	0.0548	0.0016
1.0	17271	5.0	33487	0.0	0.0012	0.0020
1.0	17271	5.0	34753	0.0	0.0304	0.0002
1.0	29673	5.0	11191	0.0	0.0013	0.0014
1.0	29673	5.0	23349	0.0	0.0023	0.0900
1.0	29673	5.0	27608	0.0	0.0560	0.1375
1.0	29673	5.0	29654	0.0	0.2415	0.0227
1.0	29673	5.0	29905	0.0	0.0113	0.0300
1.0	29673	5.0	33487	0.0	0.0918	0.0056
1.0	29673	5.0	34753	0.0	0.0124	0.0240
1.0	34790	5.0	11191	0.0	0.0000	0.0021
1.0	34790	5.0	23349	0.0	0.0077	0.0403
1.0	34790	5.0	27608	0.0	0.0000	0.0033
1.0	34790	5.0	29654	0.0	0.0037	0.0307
1.0	3 .790	5.0	29905	0.0	0.0708	0.0345
1.0	34790	5.0	33487	0.0	0.0193	0.0427
1.0	34790	5.0	34753	0.0	0.0013	0.1287
1.0	35844	5.0	11191	0.0	0.0035	0.0002
1.0	35844	5.0	23349	0.0	0.0000	0.0120
1.0	35844	5.0	27608	0.0	0.0261	0.0006
1.0	35844	5.0	29654	0.0	0.0013	0.0169
1.0	35844	5.0	29905	0.0	0.0075	0.0359
1.0	35844	5.0	33487	0.0	0.0063	0.0170
1.0	35844	5.0	34753	0.0	0.0563	0.0006
1.0	2760	6.0	12329	0.0	0.0	0.3805
1.0	2760	6.0	19602	0.0	0.0	0.0670
1.0	2760	6.0	24758	0.0	0.0	0.0588
1.0	2760	6.0	29586	0.0	0.0	0.0000
1.0	2760	6.0	32254	0.0	0.0	0.0009
1.0	2760	6.0	32844	0.0	0.0	0.0005
1.0	2760	6.0	34661	0.0	0.0	0.0003
1.0	2760	6.0	34974	0.0	0.0	0.0001
1.0	17271	6.0	12329	0.0	0.0	0.0000
1.0	17271	6.0	19602	0.0	0.0	0.0045
1.0	17271	6.0	24758	0.0	0.0	0.6059
1.0	17271	6.0	29586	0.0	0.0	0.0162
1.0	17271	6.0	32254	0.0	0.0	0.0002
1.0	17271	6.0	32844	0.0	0.0	0.0070
1.0	17271	6.0	34661	0.0	0.0	0.0033
1.0	17271	6.0	34974	0.0	0.0	0.0392
1.0	29673	6.0	12329	0.0	0.0	0.0006
1.0	29673	6.0	19602	0.0	0.0	0.0060
1.0	29673	6.0	24758	0.0	0.0	0.0256
1.0	29673	6.0	29586	0.0	0.0	0.0449
1.0	29673	6.0	32254	0.0	0.0	0.0172

Appendix XV (Contir .ed)

J1	LEVEL 1	J2	LEVEL 2	(U2)2	(U4)2	(U6)2
1.0	29673	6.0	32844	0.0	0.0	0.0134
1.0	29673	6.0	34661	0.0	0.0	0.0007
1.0	29673	6.0	34974	0.0	0.0	0.0256
1.0	34790	6.0	12329	0.0	0.0	0.0024
1.0	34790	6.0	19602	0.0	0.0	0.0024
1.0	34790	6.0	24758	0.0	0.0	0.0186
1.0	34790	6.0	29586	0.0	0.0	0.0157
1.0	34790	6.0	32254	0.0	0.0	0.0068
1.0	34790	6.0	32844	0.0	0.0	0.0075
1.0	34790	6.0	34661	0.0	0.0	0.0024
1.0	34790	6.0	34974	0.0	0.0	0.0002
1.0	35844	6.0	12329	0.0	0.0	0.0039
1.0	35844	6.0	19602	0.0	0.0	0.0089
1.0	35844	6.0	24758	0.0	0.0	0.1246
1.0	35844	6.0	29586	0.0	0.0	0.0048
1.0	35844	6.0	32254	0.0	0.0	0.0449
1.0	35844	6.0	32844	0.0	0.0	0.0829
1.0	35844	6.0	34661	0.0	0.0	0.0103
1.0	35844	6.0	34974	0.0	0.0	0.0001
1.0	2760	7.0	24047	0.0	0.0	0.1847
1.0	2760	7.0	28896	0.0	0.0	0.0119
1.0	2760	7.0	32922	0.0	0.0	0.0064
1.0	2760	7.0	36295	0.0	0.0	0.0003
1.0	17271	7.0	24047	0.0	0.0	0.2369
1.0	17271	7.0	28896	0.0	0.0	0.0603
1.0	17271	7.0	32922	0.0	0.0	0.0016
1.0	17271	7.0	36295	0.0	0.0	0.0059
1.0	29673	7.0	24047	0.0	0.0	0.1958
1.0	29673	7.0	28896	0.0	0.0	0.0557
1.0	29673	7.0	32922	0.0	0.0	0.0307
1.0	29673	7.0	36295	0.0	0.0	0.0025
1.0	34790	7.0	24047	0.0	0.0	0.0562
1.0	34790	7.0	28896	0.0	0.0	0.0174
1.0	34790	7.0	32922	0.0	0.0	0.0130
1.0	34790	7.0	36295	0.0	0.0	0.0007
1.0	35844	7.0	24047	0.0	0.0	0.0078
1.0	35844	7.0	28896	0.0	0.0	0.0000
1.0	35844	7.0	32922	0.0	0.0	0.1881
1.0	35844	7.0	36295	0.0	0.0	0.0161
2.0	5350	2.0	5350	0.0883	0.1126	0.0
2.0	5350	2.0	21709	0.0128	0.0115	0.0
2.0	5350	2.0	21961	0.0014	0.0007	0.0
2.0	5350	2.0	27283	0.0030	0.0029	0.0
2.0	5350	2.0	31121	0.0000	0.0117	0.0
2.0	5350	2.0	32697	0.0029	0.0004	0.0
2.0	21709	2.0	21709	0.0163	0.1592	0.0
2.0	21709	2.0	21961	0.0129	0.0159	0.0
2.0	21709	2.0	27283	0.0453	0.0000	0.0
2.0	21709	2.0	31121	0.0039	0.0801	0.0

Appendix XV (Continued)

J1	LEVEL 1	J2	LEVEL 2	(U2)2	(U4)2	(U6)2
2.0	21709	2.0	32697	0.0887	0.0181	0.0
2.0	21961	2.0	21961	0.0012	0.0664	0.0
2.0	21961	2.0	27283	0.1495	0.0131	0.0
2.0	21961	2.0	31121	0.0127	0.0002	0.0
2.0	21961	2.0	32697	0.0888	0.0233	0.0
2.0	27283	2.0	27283	0.0432	0.0084	0.0
2.0	27283	2.0	31121	0.0236	0.0008	0.0
2.0	27283	2.0	32697	0.1470	0.0570	0.0
2.0	31121	2.0	31121	0.0023	0.1334	0.0
2.0	31121	2.0	32697	0.0035	0.0660	0.0
2.0	32697	2.0	32697	0.0039	0.0031	0.0
2.0	5350	3.0	7590	0.1740	0.1816	0.0
2.0	5350	3.0	22649	0.0001	0.0044	0.0
2.0	5350	3.0	25281	0.0016	0.0051	0.0
2.0	5350	3.0	27968	0.0025	0.0029	0.0
2.0	5350	3.0	29265	0.0033	0.0000	0.0
2.0	5350	3.0	32147	0.0000	0.0035	0.0
2.0	5350	3.0	33981	0.0034	0.0190	0.0
2.0	21709	3.0	7590	0.0142	0.0030	0.0
2.0	21709	3.0	22649	0.1300	0.0021	0.0
2.0	21709	3.0	25281	0.0061	0.0757	0.0
2.0	21709	3.0	27968	0.1178	0.0677	0.0
2.0	21709	3.0	29265	0.0034	0.0908	0.0
2.0	21709	3.0	32147	0.0606	0.0538	0.0
2.0	21709	3.0	33981	0.0206	0.0075	0.0
2.0	21961	3.0	7590	0.0003	0.0098	0.0
2.0	21961	3.0	22649	0.1817	0.0046	0.0
2.0	21961	3.0	25281	0.0030	0.0368	0.0
2.0	21961	3.0	27968	0.0106	0.0000	0.0
2.0	21961	3.0	29265	0.0003	0.0003	0.0
2.0	21961	3.0	32147	0.0062	0.0101	0.0
2.0	21961	3.0	33981	0.0124	0.0933	0.0
2.0	27283	3.0	7590	0.0016	0.0019	0.0
2.0	27283	3.0	22649	0.0392	0.0006	0.0
2.0	27283	3.0	25281	0.0634	0.3156	0.0
2.0	27283	3.0	27968	0.1344	0.0118	0.0
2.0	27283	3.0	29265	0.0157	0.0007	0.0
2.0	27283	3.0	32147	0.0048	0.0547	0.0
2.0	27283	3.0	33981	0.0068	0.0245	0.0
2.0	31121	3.0	7590	0.0003	0.0026	0.0
2.0	31121	3.0	22649	0.1077	0.0391	0.0
2.0	31121	3.0	25281	0.0210	0.0273	0.0
2.0	31121	3.0	27968	0.1141	0.0256	0.0
2.0	31121	3.0	29265	0.0184	0.0000	0.0
2.0	31121	3.0	32147	0.1167	0.0160	0.0
2.0	31121	3.0	33981	0.0072	0.0024	0.0
2.0	32697	3.0	7590	0.0084	0.0106	0.0
2.0	32697	3.0	22649	0.0280	0.0045	0.0
2.0	32697	3.0	25281	0.0101	0.0000	0.0

Appendix XV (Continued)

J1	LEVEL 1	J2	LEVEL 2	(U2)2	(U4)2	(U6)2
2.0	32697	3.0	27968	0.0308	0.0142	0.0
2.0	32697	3.0	29265	0.0162	0.0279	0.0
2.0	32697	3.0	32147	0.0028	0.0197	0.0
2.0	32697	3.0	33981	0.1551	0.0169	0.0
2.0	5350	4.0	9544	0.2122	0.0017	0.0385
2.0	5350	4.0	23640	0.0018	0.0176	0.0361
2.0	5350	4.0	26552	0.0001	0.0096	0.0369
2.0	5350	4.0	29445	0.0000	0.0027	0.0072
2.0	5350	4.0	29928	0.0058	0.0000	0.0036
2.0	5350	4.0	31684	0.0000	0.0017	0.0029
2.0	5350	4.0	34067	0.0013	0.0236	0.0073
2.0	5350	4.0	36759	0.0000	0.0026	0.0010
2.0	21709	4.0	9544	0.0068	0.0002	0.0011
2.0	21709	4.0	23640	0.0148	0.0066	0.1158
2.0	21709	4.0	26552	0.0000	0.0305	0.0010
2.0	21709	4.0	29445	0.0000	0.0624	0.0159
2.0	21709	4.0	29928	0.0248	0.0015	0.0023
2.0	21709	4.0	31684	0.0188	0.0002	0.0414
2.0	21709	4.0	34067	0.0077	0.0617	0.0106
2.0	21709	4.0	36759	0.0041	0.0655	0.0023
2.0	21961	4.0	9544	0.0012	0.0057	0.0057
2.0	21961	4.0	23640	0.0671	0.0890	0.0655
2.0	21961	4.0	26552	0.0000	0.2163	0.0181
2.0	21961	4.0	29445	0.0018	0.0290	0.0715
2.0	21961	4.0	29928	0.0451	0.0144	0.0038
2.0	21961	4.0	31684	0.0017	0.0003	0.3351
2.0	21961	4.0	34067	0.0015	0.0541	0.0108
2.0	21961	4.0	36759	0.0007	0.0001	0.0012
2.0	27283	4.0	9544	0.0014	0.0096	0.0034
2.0	27283	4.0	23640	0.0097	0.0136	0.1252
2.0	27283	4.0	26552	0.0000	0.0350	0.0548
2.0	27283	4.0	29445	0.0016	0.0072	0.0318
2.0	27283	4.0	29928	0.1490	0.0315	0.0178
2.0	27283	4.0	31684	0.0000	0.0208	0.1847
2.0	27283	4.0	34067	0.0411	0.0022	0.1616
2.0	27283	4.0	36759	0.0007	0.0106	0.0116
2.0	31121	4.0	9544	0.0007	0.0000	0.0084
2.0	31121	4.0	23640	0.0006	0.0041	0.0026
2.0	31121	4.0	26552	0.0008	0.0070	0.2375
2.0	31121	4.0	29445	0.1467	0.0506	0.0056
2.0	31121	4.0	29928	0.0026	0.0117	0.0000
2.0	31121	4.0	31684	0.0479	0.0121	0.0645
2.0	31121	4.0	34067	0.0018	0.0544	0.0038
2.0	31121	4.0	36759	0.0073	0.0303	0.0832
2.0	32697	4.0	9544	0.0026	0.0069	0.0003
2.0	32697	4.0	23640	0.0002	0.0258	0.0019
2.0	32697	4.0	26552	0.0309	0.1662	0.0017
2.0	32697	4.0	29445	0.0244	0.0736	0.0099
2.0	32697	4.0	29928	0.0559	0.0092	0.0036

Appendix XV (Continued)

J1	LEVEL 1	J2	LEVEL 2	(U2)2	(U4)2	(U6)2
2.0	32697	4.0	31684	0.0209	0.0097	0.0000
2.0	32697	4.0	34067	0.0040	0.0373	0.0191
2.0	32697	4.0	36759	0.0052	0.0116	0.0008
2.0	5350	5.0	11191	0.0	0.3076	0.2086
2.0	5350	5.0	23349	0.0	0.0044	0.0002
2.0	5350	5.0	27608	0.0	0.0109	0.0597
2.0	5350	5.0	29654	0.0	0.0011	0.0062
2.0	5350	5.0	29905	0.0	0.0064	0.0000
2.0	5350	5.0	33487	0.0	0.0023	0.0002
2.0	5350	5.0	34753	0.0	0.0003	0.0033
2.0	21709	5.0	11191	0.0	0.0077	0.0037
2.0	21709	5.0	23349	0.0	0.0810	0.0471
2.0	21709	5.0	27608	0.0	0.0246	0.0653
2.0	21709	5.0	29654	0.0	0.1604	0.1878
2.0	21709	5.0	29905	0.0	0.0079	0.0003
2.0	21709	5.0	33487	0.0	0.0016	0.0037
2.0	21709	5.0	34753	0.0	0.0059	0.0316
2.0	21961	5.0	11191	0.0	0.0000	0.0001
2.0	21961	5.0	23349	0.0	0.0846	0.1726
2.0	21961	5.0	27608	0.0	0.1189	0.1284
2.0	21961	5.0	29654	0.0	0.0001	0.0010
2.0	21961	5.0	29905	0.0	0.2978	0.0057
2.0	21961	5.0	33487	0.0	0.0060	0.0004
2.0	21961	5.0	34753	0.0	0.0000	0.0433
2.0	27283	5.0	11191	0.0	0.0086	0.0017
2.0	27283	5.0	23349	0.0	0.0821	0.0128
2.0	27283	5.0	27608	0.0	0.1470	0.0041
2.0	27283	5.0	29654	0.0	0.0958	0.0423
2.0	27283	5.0	29905	0.0	0.0056	0.0094
2.0	27283	5.0	33487	0.0	0.0416	0.0171
2.0	27283	5.0	34753	0.0	0.0045	0.0173
2.0	31121	5.0	11191	0.0	0.0009	0.0009
2.0	31121	5.0	23349	0.0	0.0345	0.0000
2.0	31121	5.0	27608	0.0	0.0697	0.0695
2.0	31121	5.0	29654	0.0	0.0236	0.0016
2.0	31121	5.0	29905	0.0	0.0051	0.0044
2.0	31121	5.0	33487	0.0	0.0031	0.0034
2.0	31121	5.0	34753	0.0	0.0318	0.0101
2.0	32697	5.0	11191	0.0	0.0000	0.0086
2.0	32697	5.0	23349	0.0	0.0384	0.0999
2.0	32697	5.0	27608	0.0	0.0260	0.0280
2.0	32697	5.0	29654	0.0	0.0460	0.0030
2.0	32697	5.0	29905	0.0	0.0758	0.1252
2.0	32697	5.0	33487	0.0	0.0000	0.0009
2.0	32697	5.0	34753	0.0	0.0011	0.0234
2.0	5350	6.0	12329	0.0	0.0538	0.3819
2.0	5350	6.0	19602	0.0	0.0004	0.0555
2.0	5350	6.0	24758	0.0	0.0000	0.0545
2.0	5350	6.0	29586	0.0	0.0044	0.0275

Appendix XV (Continued)

J1	LEVEL 1	J2	LEVEL 2	(U2)2	(U4)2	(U6)2
2.0	5350	6.0	32254	0.0	0.0070	0.0009
2.0	5350	6.0	32844	0.0	0.0125	0.0008
2.0	5350	6.0	34661	0.0	0.0082	0.0032
2.0	5350	6.0	34974	0.0	0.0161	0.0048
2.0	21709	6.0	12329	0.0	0.0003	0.0130
2.0	21709	6.0	19602	0.0	0.0229	0.2830
2.0	21709	6.0	24758	0.0	0.0047	0.0018
2.0	21709	6.0	29586	0.0	0.2083	0.0611
2.0	21709	6.0	32254	0.0	0.0410	0.1126
2.0	21709	6.0	32844	0.0	0.0073	0.0001
2.0	21709	6.0	34661	0.0	0.0249	0.2042
2.0	21709	6.0	34974	0.0	0.1173	0.0603
2.0	21961	6.0	12329	0.0	0.0029	0.0269
2.0	21961	6.0	19602	0.0	0.0542	0.2485
2.0	21961	6.0	24758	0.0	0.0017	0.0058
2.0	21961	6.0	29586	0.0	0.0018	0.2196
2.0	21961	6.0	32254	0.0	0.0221	0.0359
2.0	21961	6.0	32844	0.0	0.0012	0.0399
2.0	21961	6.0	34661	0.0	0.0000	0.0555
2.0	21961	6.0	34974	0.0	0.0036	0.1494
2.0	27283	6.0	12329	0.0	0.0027	0.0066
2.0	27283	6.0	19602	0.0	0.0035	0.0924
2.0	27283	6.0	24758	0.0	0.0391	0.0040
2.0	27283	6.0	29586	0.0	0.1229	0.0108
2.0	27283	6.0	32254	0.0	0.0004	0.0036
2.0	27283	6.0	32844	0.0	0.1394	0.0117
2.0	27283	6.0	34661	0.0	0.0053	0.0001
2.0	27283	6.0	34974	0.0	0.0000	0.1013
2.0	31121	6.0	12329	0.0	0.0001	0.0011
2.0	31121	6.0	19602	0.0	0.1074	0.0832
2.0	31121	6.0	24758	0.0	0.1126	0.0032
2.0	31121	6.0	29586	0.0	0.0023	0.3198
2.0	31121	6.0	32254	0.0	0.0001	0.0009
2.0	31121	6.0	32844	0.0	0.0177	0.0022
2.0	31121	6.0	34661	0.0	0.0732	0.0569
2.0	31121	6.0	34974	0.0	0.0148	0.0000
2.0	32697	6.0	12329	0.0	0.0002	0.0133
2.0	32697	6.0	19602	0.0	0.0087	0.0453
2.0	32697	6.0	24758	0.0	0.0080	0.0246
2.0	32697	6.0	29586	0.0	0.0001	0.0024
2.0	32697	6.0	32254	0.0	0.0107	0.0567
2.0	32697	6.0	32844	0.0	0.0841	0.0134
2.0	32697	6.0	34661	0.0	0.1427	0.0156
2.0	32697	6.0	34974	0.0	0.1056	0.0000
2.0	5350	7.0	24047	0.0	0.0	0.0357
2.0	5350	7.0	28896	0.0	0.0	0.0632
2.0	5350	7.0	32922	0.0	0.0	0.0010
2.0	5350	7.0	36295	0.0	0.0	0.0000
2.0	21709	7.0	24047	0.0	0.0	0.0012

Appendix XV (Continued)

J1	LEVEL 1	J2	LEVEL 2	(U2)2	(U4)2	(U6)2
2.0	21709	7.0	28896	0.0	0.0	0.4913
2.0	21709	7.0	32922	0.0	0.0	0.0032
2.0	21709	7.0	36295	0.0	0.0	0.0140
2.0	21961	7.0	24047	0.0	0.0	0.4626
2.0	21961	7.0	28896	0.0	0.0	0.0411
2.0	21961	7.0	32922	0.0	0.0	0.0002
2.0	21961	7.0	36295	0.0	0.0	0.0002
2.0	27283	7.0	24047	0.0	0.0	0.0280
2.0	27283	7.0	28896	0.0	0.0	0.0384
2.0	27283	7.0	32922	0.0	0.0	0.0058
2.0	27283	7.0	36295	0.0	0.0	0.0208
2.0	31121	7.0	24047	0.0	0.0	0.0170
2.0	31121	7.0	28896	0.0	0.0	0.0000
2.0	31121	7.0	32922	0.0	0.0	0.0526
2.0	31121	7.0	36295	0.0	0.0	0.0012
2.0	32697	7.0	24047	0.0	0.0	0.1446
2.0	32697	7.0	28896	0.0	0.0	0.0010
2.0	32697	7.0	32922	0.0	0.0	0.1276
2.0	32697	7.0	36295	0.0	0.0	0.0197
2.0	5350	8.0	26782	0.0	0.0	0.1343
2.0	5350	8.0	32715	0.0	0.0	0.0013
2.0	5350	8.0	33422	0.0	0.0	0.0145
2.0	21709	8.0	26782	0.0	0.0	0.0786
2.0	21709	8.0	32715	0.0	0.0	0.0071
2.0	21709	8.0	33422	0.0	0.0	0.0150
2.0	21961	8.0	26782	0.0	0.0	0.0618
2.0	21961	8.0	32715	0.0	0.0	0.0436
2.0	21961	8.0	33422	0.0	0.0	0.0000
2.0	27283	8.0	26782	0.0	0.0	0.4883
2.0	27283	8.0	32715	0.0	0.0	0.0260
2.0	27283	8.0	33422	0.0	0.0	0.0519
2.0	31121	8.0	26782	0.0	0.0	0.0350
2.0	31121	8.0	32715	0.0	0.0	0.0736
2.0	31121	8.0	33422	0.0	0.0	0.0000
2.0	32697	8.0	26782	0.0	0.0	0.0530
2.0	32697	8.0	32715	0.0	0.0	0.1097
2.0	32697	8.0	33422	0.0	0.0	0.0438
3.0	7590	3.0	7590	0.0314	0.0137	0.0319
3.0	7590	3.0	22649	0.0035	0.0162	0.0109
3.0	7590	3.0	25281	0.0097	0.0000	0.0210
3.0	7590	3.0	27968	0.0001	0.0065	0.0037
3.0	7590	3.0	29265	0.0000	0.0026	0.0030
3.0	7590	3.0	32147	0.0016	0.0022	0.0151
3.0	7590	3.0	33981	0.0004	0.0060	0.0001
3.0	22649	3.0	22649	0.0523	0.1507	0.0085
3.0	22649	3.0	25281	0.0409	0.0020	0.1078
3.0	22649	3.0	27968	0.0883	0.1061	0.2065
3.0	22649	3.0	29265	0.0033	0.0229	0.0043
3.0	22649	3.0	32147	0.0173	0.0061	0.0004

Appendix XV (Continued)

J1	LEVEL 1	J2	LEVEL 2	(U2)2	(U4)2	(U6)2
3.0	22649	3.0	33981	0.0077	0.1198	0.0088
3.0	25281	3.0	25281	0.0058	0.0001	0.0052
3.0	25281	3.0	27968	0.0133	0.0157	0.0229
3.0	25281	3.0	29265	0.0182	0.0005	0.0102
3.0	25281	3.0	32147	0.0089	0.0802	0.0801
3.0	25281	3.0	33981	0.3534	0.0068	0.0002
3.0	27968	3.0	27968	0.0048	0.0018	0.1115
3.0	27968	3.0	29265	0.0003	0.0027	0.0362
3.0	27968	3.0	32147	0.0141	0.0053	0.2170
3.0	27968	3.0	33981	0.0007	0.0604	0.0015
3.0	29265	3.0	29265	0.0003	0.0404	0.0068
3.0	29265	3.0	32147	0.0000	0.0293	0.0089
3.0	29265	3.0	33981	0.0098	0.0335	0.0000
3.0	32147	3.0	32147	0.0510	0.1418	0.0046
3.0	32147	3.0	33981	0.0586	0.0150	0.0473
3.0	33981	3.0	33981	0.0668	0.0017	0.0002
3.0	7590	4.0	9544	0.3872	0.1355	0.1477
3.0	7590	4.0	23640	0.0017	0.0018	0.0020
3.0	7590	4.0	26552	0.0016	0.0012	0.0385
3.0	7590	4.0	29445	0.0001	0.0020	0.0097
3.0	7590	4.0	29928	0.0093	0.0003	0.0020
3.0	7590	4.0	31684	0.0000	0.0002	0.0006
3.0	7590	4.0	34067	0.0014	0.0034	0.0019
3.0	7590	4.0	36759	0.0011	0.0141	0.0068
3.0	22649	4.0	9544	0.0021	0.0012	0.0052
3.0	22649	4.0	23640	0.6347	0.0015	0.0068
3.0	22649	4.0	26552	0.0123	0.0630	0.1684
3.0	22649	4.0	29445	0.0010	0.0021	0.0012
3.0	22649	4.0	29928	0.0027	0.0279	0.0002
3.0	22649	4.0	31684	0.0029	0.0000	0.0005
3.0	22649	4.0	34067	0.0826	0.0008	0.0008
3.0	22649	4.0	36759	0.0015	0.0300	0.2031
3.0	25281	4.0	9544	0.0247	0.0009	0.0119
3.0	25281	4.0	23640	0.0864	0.0335	0.1798
3.0	25281	4.0	26552	0.0081	0.1603	0.1755
3.0	25281	4.0	29445	0.0409	0.0073	0.0156
3.0	25281	4.0	29928	0.0026	0.0370	0.0002
3.0	25281	4.0	31684	0.0327	0.0001	0.0108
3.0	25281	4.0	34067	0.0092	0.0026	0.0075
3.0	25281	4.0	36759	0.0433	0.0690	0.0021
3.0	27968	4.0	9544	0.0001	0.0021	0.0045
3.0	27968	4.0	23640	0.0138	0.1114	0.0126
3.0	27968	4.0	26552	0.2302	0.0327	0.0034
3.0	27968	4.0	29445	0.0003	0.0013	0.3522
3.0	27968	4.0	29928	0.0006	0.0007	0.0671
3.0	27968	4.0	31684	0.0760	0.0029	0.0093
3.0	27968	4.0	34067	0.0594	0.0458	0.0250
3.0	27968	4.0	36759	0.0086	0.0087	0.0113
3.0	29265	4.0	9544	0.0011	0.0011	0.0047

Appendix XV (Continued)

J1	LEVEL 1	J2	LEVEL 2	(U2)2	(U4)2	(U6)2
3.0	29265	4.0	23640	0.0071	0.0101	0.0034
3.0	29265	4.0	26552	0.0073	0.0000	0.0028
3.0	29265	4.0	29445	0.2432	0.2376	0.0094
3.0	29265	4.0	29928	0.0019	0.0204	0.0065
3.0	29265	4.0	31684	0.0811	0.0226	0.3161
3.0	29265	4.0	34067	0.0206	0.0989	0.0299
3.0	29265	4.0	36759	0.0096	0.0004	0.0001
3.0	32147	4.0	9544	0.0009	0.0047	0.0000
3.0	32147	4.0	23640	0.1212	0.0050	0.0001
3.0	32147	4.0	26552	0.1016	0.0091	0.0324
3.0	32147	4.0	29445	0.0065	0.0272	0.0207
3.0	32147	4.0	29928	0.0089	0.0551	0.0019
3.0	32147	4.0	31684	0.0390	0.0252	0.0000
3.0	32147	4.0	34067	0.0935	0.0000	0.0007
3.0	32147	4.0	36759	0.0051	0.0253	0.0777
3.0	33981	4.0	9544	0.0075	0.0000	0.0097
3.0	33981	4.0	23640	0.0291	0.0060	0.1108
3.0	33981	4.0	26552	0.0953	0.0181	0.0141
3.0	33981	4.0	29445	0.0067	0.0017	0.0136
3.0	33981	4.0	29928	0.0114	0.0513	0.0254
3.0	33981	4.0	31684	0.0007	0.0426	0.0000
3.0	33981	4.0	34067	0.0040	0.0106	0.0205
3.0	33981	4.0	36759	0.0842	0.0488	0.0146
3.0	7590	5.0	11191	0.1739	0.2097	0.3243
3.0	7590	5.0	23349	0.0036	0.0237	0.0437
3.0	7590	5.0	27608	0.0007	0.0268	0.0004
3.0	7590	5.0	29654	0.0009	0.0004	0.0016
3.0	7590	5.0	29905	0.0040	0.0019	0.0211
3.0	7590	5.0	33487	0.0036	0.0021	0.0000
3.0	7590	5.0	34753	0.0018	0.0201	0.0274
3.0	22649	5.0	11191	0.0001	0.0035	0.0243
3.0	22649	5.0	23349	0.0585	0.0003	0.2382
3.0	22649	5.0	27608	0.0022	0.4205	0.0149
3.0	22649	5.0	29654	0.0030	0.1178	0.2164
3.0	22649	5.0	29905	0.0068	0.0254	0.0036
3.0	22649	5.0	33487	0.0090	0.0070	0.0053
3.0	22649	5.0	34753	0.0014	0.0486	0.0025
3.0	25281	5.0	11191	0.0000	0.0024	0.0005
3.0	25281	5.0	23349	0.0646	0.0095	0.0198
3.0	25281	5.0	27608	0.0096	0.0056	0.0455
3.0	25281	5.0	29654	0.0012	0.0002	0.0000
3.0	25281	5.0	29905	0.0509	0.0089	0.1205
3.0	25281	5.0	33487	0.0001	0.0006	0.0003
3.0	25281	5.0	34753	0.0198	0.1447	0.0129
3.0	27968	5.0	11191	0.0000	0.0027	0.0028
3.0	27968	5.0	23349	0.0002	0.0022	0.0334
3.0	27968	5.0	27608	0.0000	0.0159	0.0781
3.0	27968	5.0	29654	0.0052	0.0036	0.0206
3.0	27968	5.0	29905	0.1396	0.0135	0.0629

Appendix XV (Continued)

J1	LEVEL 1	J2	LEVEL 2	(U2)2	(U4)2	(U6)2
3.0	27968	5.0	33487	0.0003	0.0014	0.0007
3.0	27968	5.0	34753	0.0297	0.1029	0.0786
3.0	29265	5.0	11191	0.0000	0.0009	0.0000
3.0	29265	5.0	23349	0.0007	0.0003	0.0963
3.0	29265	5.0	27608	0.0243	0.0012	0.0114
3.0	29265	5.0	29654	0.0385	0.0039	0.0056
3.0	29265	5.0	29905	0.0130	0.0636	0.1216
3.0	29265	5.0	33487	0.0264	0.0022	0.0072
3.0	29265	5.0	34753	0.0192	0.0002	0.1279
3.0	32147	5.0	11191	0.0016	0.0012	0.0008
3.0	32147	5.0	23349	0.0097	0.0122	0.0171
3.0	32147	5.0	27608	0.0079	0.0016	0.0643
3.0	32147	5.0	29654	0.2388	0.0002	0.0338
3.0	32147	5.0	29905	0.0229	0.0021	0.0040
3.0	32147	5.0	33487	0.0034	0.0704	0.0111
3.0	32147	5.0	34753	0.0518	0.0204	0.1326
3.0	33981	5.0	11191	0.0049	0.0002	0.0110
3.0	33981	5.0	23349	0.0000	0.0030	0.0624
3.0	33981	5.0	27608	0.0989	0.0117	0.0050
3.0	33981	5.0	29654	0.0059	0.0012	0.0051
3.0	33981	5.0	29905	0.0401	0.0143	0.0020
3.0	33981	5.0	33487	0.0810	0.0402	0.0638
3.0	33981	5.0	34753	0.0169	0.0218	0.0108
3.0	7590	6.0	12329	0.0	0.2308	0.3105
3.0	7590	6.0	19602	0.0	0.0025	0.0049
3.0	7590	6.0	24758	0.0	0.0112	0.1288
3.0	7590	6.0	29586	0.0	0.0043	0.0077
3.0	7590	6.0	32254	0.0	0.0022	0.0209
3.0	7590	6.0	32844	0.0	0.0233	0.0111
3.0	7590	6.0	34661	0.0	0.0013	0.0003
3.0	7590	6.0	34974	0.0	0.0007	0.0004
3.0	22649	6.0	12329	0.0	0.0098	0.0001
3.0	22649	6.0	19602	0.0	0.2913	0.1868
3.0	22649	6.0	24758	0.0	0.0009	0.0784
3.0	22649	6.0	29586	0.0	0.0290	0.0001
3.0	22649	6.0	32254	0.0	0.0231	0.0736
3.0	22649	6.0	32844	0.0	0.0783	0.1170
3.0	22649	6.0	34661	0.0	0.0013	0.0309
3.0	22649	6.0	34974	0.0	0.0131	0.1160
3.0	25281	6.0	12329	0.0	0.0047	0.0008
3.0	25281	6.0	19602	0.0	0.0169	0.0109
3.0	25281	6.0	24758	0.0	0.0286	0.0002
3.0	25281	6.0	29586	0.0	0.0477	0.0289
3.0	25281	6.0	32254	0.0	0.0040	0.0278
3.0	25281	6.0	32844	0.0	0.0457	0.1316
3.0	25281	6.0	34661	0.0	0.2326	0.0953
3.0	25281	6.0	34974	0.0	0.0289	0.0665
3.0	27968	6.0	12329	0.0	0.0263	0.0159
3.0	27968	6.0	19602	0.0	0.0953	0.0000

Appendix XV (Continued)

J1	LEVEL 1	J2	LEVEL 2	(U2)2	(U4)2	(U6)2
3.0	27968	6.0	24758	0.0	0.0375	0.1942
3.0	27968	6.0	29586	0.0	0.0001	0.0020
3.0	27968	6.0	32254	0.0	0.0683	0.0685
3.0	27968	6.0	32844	0.0	0.0144	0.0312
3.0	27968	6.0	34661	0.0	0.1012	0.0113
3.0	27968	6.0	34974	0.0	0.0416	0.0030
3.0	29265	6.0	12329	0.0	0.0003	0.0288
3.0	29265	6.0	19602	0.0	0.0899	0.0756
3.0	29265	6.0	24758	0.0	0.1427	0.4068
3.0	29265	6.0	29586	0.0	0.0160	0.0089
3.0	29265	6.0	32254	0.0	0.1351	0.0051
3.0	29265	6.0	32844	0.0	0.2557	0.0000
3.0	29265	6.0	34661	0.0	0.0125	0.0039
3.0	29265	6.0	34974	0.0	0.0010	0.0572
3.0	32147	6.0	12329	0.0	0.0031	0.0000
3.0	32147	6.0	19602	0.0	0.0070	0.0047
3.0	32147	6.0	24758	0.0	0.0010	0.0383
3.0	32147	6.0	29586	0.0	0.0013	0.0649
3.0	32147	6.0	32254	0.0	0.0252	0.0012
3.0	32147	6.0	32844	0.0	0.0628	0.0039
3.0	32147	6.0	34661	0.0	0.0000	0.0401
3.0	32147	6.0	34974	0.0	0.0044	0.0174
3.0	33981	6.0	12329	0.0	0.0010	0.0049
3.0	33981	6.0	19602	0.0	0.0413	0.0001
3.0	33981	6.0	24758	0.0	0.0094	0.0189
3.0	33981	6.0	29586	0.0	0.0310	0.0194
3.0	33981	6.0	32254	0.0	0.0033	0.0070
3.0	33981	6.0	32844	0.0	0.0555	0.0409
3.0	33981	6.0	34661	0.0	0.0007	0.0025
3.0	33981	6.0	34974	0.0	0.1242	0.0694
3.0	7590	7.0	24047	0.0	0.0000	0.0266
3.0	7590	7.0	28896	0.0	0.0012	0.0176
3.0	7590	7.0	32922	0.0	0.0025	0.0294
3.0	7590	7.0	36295	0.0	0.0180	0.0001
3.0	22649	7.0	24047	0.0	0.0024	0.3640
3.0	22649	7.0	28896	0.0	0.0090	0.1073
3.0	22649	7.0	32922	0.0	0.0637	0.0238
3.0	22649	7.0	36295	0.0	0.0074	0.0106
3.0	25281	7.0	24047	0.0	0.2261	0.1064
3.0	25281	7.0	28896	0.0	0.0072	0.0140
3.0	25281	7.0	32922	0.0	0.1884	0.0830
3.0	25281	7.0	36295	0.0	0.0486	0.0119
3.0	27968	7.0	24047	0.0	0.0386	0.0008
3.0	27968	7.0	28896	0.0	0.0409	0.0008
3.0	27968	7.0	32922	0.0	0.0212	0.0382
3.0	27968	7.0	36295	0.0	0.0546	0.0062
3.0	29265	7.0	24047	0.0	0.0081	0.0888
3.0	29265	7.0	28896	0.0	0.0001	0.1777
3.0	29265	7.0	32922	0.0	0.0011	0.0274

Appendix XV (Continued)

J1	LEVEL 1	J2	LEVEL 2	(U2)2	(U4)2	(U6)2
3.0	29265	7.0	36295	0.0	0.0022	0.0123
3.0	32147	7.0	24047	0.0	0.0595	0.0331
3.0	32147	7.0	28896	0.0	0.1306	0.0224
3.0	32147	7.0	32922	0.0	0.0026	0.2724
3.0	32147	7.0	36295	0.0	0.0023	0.0049
3.0	33981	7.0	24047	0.0	0.0052	0.0712
3.0	33981	7.0	28896	0.0	0.0204	0.0130
3.0	33981	7.0	32922	0.0	0.0017	0.0243
3.0	33981	7.0	36295	0.0	0.0596	0.0041
3.0	7590	8.0	26782	0.0	0.0	0.0386
3.0	7590	8.0	32715	0.0	0.0	0.0251
3.0	7590	8.0	33422	0.0	0.0	0.0018
3.0	22649	8.0	26782	0.0	0.0	0.2278
3.0	22649	8.0	32715	0.0	0.0	0.0029
3.0	22649	8.0	33422	0.0	0.0	0.0002
3.0	25281	8.0	26782	0.0	0.0	0.2467
3.0	25281	8.0	32715	0.0	0.0	0.3125
3.0	25281	8.0	33422	0.0	0.0	0.0354
3.0	27968	8.0	26782	0.0	0.0	0.0304
3.0	27968	8.0	32715	0.0	0.0	0.0401
3.0	27968	8.0	33422	0.0	0.0	0.0751
3.0	29265	8.0	26782	0.0	0.0	0.0773
3.0	29265	8.0	32715	0.0	0.0	0.0160
3.0	29265	8.0	33422	0.0	0.0	0.0097
3.0	32147	8.0	26782	0.0	0.0	0.0134
3.0	32147	8.0	32715	0.0	0.0	0.0051
3.0	32147	8.0	33422	0.0	0.0	0.0616
3.0	33981	8.0	26782	0.0	0.0	0.0014
3.0	33981	8.0	32715	0.0	0.0	0.0489
3.0	33981	8.0	33422	0.0	0.0	0.0354
3.0	7590	9.0	28441	0.0	0.0	0.1065
3.0	22649	9.0	28441	0.0	0.0	0.0237
3.0	25281	9.0	28441	0.0	0.0	0.0055
3.0	27968	9.0	28441	0.0	0.0	0.7590
3.0	29265	9.0	28441	0.0	0.0	0.0276
3.0	32147	9.0	28441	0.0	0.0	0.0059
3.0	33981	9.0	28441	0.0	0.0	0.0399
4.0	9544	4.0	9544	0.0051	0.2359	0.2947
4.0	9544	4.0	23640	0.0080	0.0167	0.0290
4.0	9544	4.0	26552	0.0025	0.0016	0.0000
4.0	9544	4.0	29445	0.0019	0.0012	0.0048
4.0	9544	4.0	29928	0.0000	0.0002	0.0063
4.0	9544	4.0	31684	0.0002	0.0152	0.0021
4.0	9544	4.0	34067	0.0042	0.0098	0.0124
4.0	9544	4.0	36759	0.0015	0.0149	0.0063
4.0	23640	4.0	23640	0.0264	0.0539	0.1063
4.0	23640	4.0	26552	0.0598	0.0027	0.0115
4.0	23640	4.0	29445	0.0138	0.0249	0.0212
4.0	23640	4.0	29928	0.0196	0.0907	0.0202

Appendix XV (Continued)

J1	LEVEL 1	J2	LEVEL 2	(U2)2	(U4)2	(U6)2
4.0	23640	4.0	31684	0.0009	0.0042	0.0925
4.0	23640	4.0	34067	0.0327	0.1217	0.0249
4.0	23640	4.0	36759	0.0000	0.1780	0.1395
4.0	26552	4.0	26552	0.0012	0.0061	0.1533
4.0	26552	4.0	29445	0.0023	0.0033	0.0095
4.0	26552	4.0	29928	0.0004	0.0084	0.0413
4.0	26552	4.0	31684	0.0381	0.0127	0.0015
4.0	26552	4.0	34067	0.2146	0.0783	0.0315
4.0	26552	4.0	36759	0.2498	0.0303	0.0014
4.0	29445	4.0	29445	0.0122	0.0021	0.0007
4.0	29445	4.0	29928	0.0228	0.0104	0.0010
4.0	29445	4.0	31684	0.0029	0.0011	0.0233
4.0	29445	4.0	34067	0.0118	0.0090	0.0420
4.0	29445	4.0	36759	0.0259	0.0126	0.0088
4.0	29928	4.0	29928	0.0105	0.0050	0.0048
4.0	29928	4.0	31684	0.0020	0.0037	0.2650
4.0	29928	4.0	34067	0.0016	0.0395	0.0001
4.0	29928	4.0	36759	0.0145	0.0093	0.0025
4.0	31684	4.0	31684	0.0194	0.0145	0.0007
4.0	31684	4.0	34067	0.0016	0.0212	0.0273
4.0	31684	4.0	36759	0.0320	0.0037	0.0048
4.0	34067	4.0	34067	0.0736	0.0005	0.3608
4.0	34067	4.0	36759	0.0072	0.0045	0.0007
4.0	36759	4.0	36759	0.2637	0.0010	0.0071
4.0	9544	5.0	11191	0.5884	0.0068	0.3478
4.0	9544	5.0	23349	0.0010	0.0016	0.0205
4.0	9544	5.0	27608	0.0026	0.0023	0.0185
4.0	9544	5.0	29654	0.0002	0.0146	0.0505
4.0	9544	5.0	29905	0.0109	0.0015	0.0072
4.0	9544	5.0	33487	0.0075	0.0001	0.0116
4.0	9544	5.0	34753	0.0044	0.0000	0.0065
4.0	23640	5.0	11191	0.0016	0.0000	0.0070
4.0	23640	5.0	23349	0.6265	0.0835	0.0512
4.0	23640	5.0	27608	0.1124	0.0578	0.3102
4.0	23640	5.0	29654	0.0054	0.0004	0.0519
4.0	23640	5.0	29905	0.0151	0.0139	0.0039
4.0	23640	5.0	33487	0.0000	0.0133	0.0655
4.0	23640	5.0	34753	0.0729	0.0097	0.0000
4.0	26552	5.0	11191	0.0393	0.0006	0.0060
4.0	26552	5.0	23349	0.2515	0.0639	0.0815
4.0	26552	5.0	27608	0.1101	0.0532	0.0156
4.0	26552	5.0	29654	0.0599	0.0000	0.0308
4.0	26552	5.0	29905	0.0000	0.0673	0.0667
4.0	26552	5.0	33487	0.0102	0.0223	0.0065
4.0	26552	5.0	34753	0.0004	0.0065	0.0044
4.0	29445	5.0	11191	0.0041	0.0009	0.0348
4.0	29445	5.0	23349	0.0240	0.1216	0.1027
4.0	29445	5.0	27608	0.0922	0.0018	0.1273
4.0	29445	5.0	29654	0.2381	0.1917	0.0173

Appendix XV (Continued)

J1	LEVEL 1	J2	LEVEL 2	(U2)2	(U4)2	(U6)2
4.0	29445	5.0	29905	0.1391	0.0580	0.0188
4.0	29445	5.0	33487	0.0367	0.0021	0.1731
4.0	29445	5.0	34753	0.0032	0.0000	0.0002
4.0	29928	5.0	11191	0.0002	0.0000	0.0148
4.0	29928	5.0	23349	0.0103	0.0160	0.0046
4.0	29928	5.0	27608	0.0001	0.0025	0.0480
4.0	29928	5.0	29654	0.0084	0.0308	0.0001
4.0	29928	5.0	29905	0.2502	0.0187	0.0075
4.0	29928	5.0	33487	0.0092	0.1745	0.0080
4.0	29928	5.0	34753	0.0093	0.0008	0.1290
4.0	31684	5.0	11191	0.0006	0.0149	0.0000
4.0	31684	5.0	23349	0.0008	0.0580	0.0025
4.0	31684	5.0	27608	0.0815	0.0185	0.0088
4.0	31684	5.0	29654	0.1913	0.0313	0.0047
4.0	31684	5.0	29905	0.0267	0.0245	0.0208
4.0	31684	5.0	33487	0.0004	0.0265	0.1958
4.0	31684	5.0	34753	0.0081	0.0178	0.0001
4.0	34067	5.0	11191	0.0013	0.0146	0.0034
4.0	34067	5.0	23349	0.1669	0.0603	0.0055
4.0	34067	5.0	27608	0.0013	0.0042	0.0000
4.0	34067	5.0	29654	0.2454	0.0171	0.0019
4.0	34067	5.0	29905	0.0535	0.1128	0.1173
4.0	34067	5.0	33487	0.0163	0.0047	0.0304
4.0	34067	5.0	34753	0.0313	0.0001	0.0001
4.0	36759	5.0	11191	0.0050	0.0062	0.0029
4.0	36759	5.0	23349	0.0012	0.0222	0.0147
4.0	36759	5.0	27608	0.3955	0.0335	0.0052
4.0	36759	5.0	29654	0.0013	0.0250	0.0203
4.0	36759	5.0	29905	0.0265	0.0000	0.1219
4.0	36759	5.0	33487	0.0002	0.0040	0.0180
4.0	36759	5.0	34753	0.1227	0.0358	0.0213
4.0	9544	6.0	12329	0.0831	0.4463	0.1759
4.0	9544	6.0	19602	0.0039	0.0515	0.0563
4.0	9544	6.0	24758	0.0032	0.0100	0.0003
4.0	9544	6.0	29586	0.0023	0.0182	0.0769
4.0	9544	6.0	32254	0.0021	0.0311	0.0172
4.0	9544	6.0	32844	0.0002	0.0076	0.0142
4.0	9544	6.0	34661	0.0048	0.0003	0.0045
4.0	9544	6.0	34974	0.0019	0.0148	0.0071
4.0	23640	6.0	12329	0.0017	0.0018	0.0115
4.0	23640	6.0	19602	0.0619	0.0458	0.1319
4.0	23640	6.0	24758	0.0040	0.2356	0.1762
4.0	23640	6.0	29586	0.0028	0.3145	0.0877
4.0	23640	6.0	32254	0.0130	0.1754	0.0348
4.0	23640	6.0	32844	0.0008	0.0680	0.0277
4.0	23640	6.0	34661	0.0015	0.0345	0.0007
4.0	23640	6.0	34974	0.0153	0.0098	0.0171
4.0	26552	6.0	12329	0.0011	0.0053	0.0001
4.0	26552	6.0	19602	0.0226	0.0123	0.0062

Appendix XV (Continued)

J1	LEVEL 1	J2	LEVEL 2	(U2)2	(U4)2	(U6)2
4.0	26552	6.0	24758	0.0080	0.0152	0.0381
4.0	26552	6.0	29586	0.1982	0.0046	0.0664
4.0	26552	6.0	32254	0.0082	0.0044	0.0030
4.0	26552	6.0	32844	0.0008	0.0066	0.0205
4.0	26552	6.0	34661	0.0008	0.0625	0.0007
4.0	26552	6.0	34974	0.0068	0.0288	0.0515
4.0	29445	6.0	12329	0.0030	0.0001	0.0192
4.0	29445	6.0	19602	0.0954	0.0025	0.3003
4.0	29445	6.0	24758	0.0530	0.0524	0.0042
4.0	29445	6.0	29586	0.0006	0.0099	0.0675
4.0	29445	6.0	32254	0.0079	0.0448	0.0016
4.0	29445	6.0	32844	0.0037	0.0576	0.0194
4.0	29445	6.0	34661	0.0091	0.0393	0.0071
4.0	29445	6.0	34974	0.0024	0.0071	0.0086
4.0	29928	6.0	12329	0.0002	0.0001	0.1338
4.0	29928	6.0	19602	0.0059	0.0549	0.4481
4.0	29928	6.0	24758	0.0049	0.0406	0.0019
4.0	29928	6.0	29586	0.0302	0.0516	0.0948
4.0	29928	6.0	32254	0.0000	0.0000	0.0280
4.0	29928	6.0	32844	0.0590	0.0278	0.0205
4.0	29928	6.0	34661	0.0026	0.0077	0.0009
4.0	29928	6.0	34974	0.0001	0.0064	0.0001
4.0	31684	6.0	12329	0.0141	0.0078	0.0047
4.0	31684	6.0	19602	0.0007	0.0527	0.0588
4.0	31684	6.0	24758	0.0577	0.0096	0.0052
4.0	31684	6.0	29586	0.0662	0.0103	0.0074
4.0	31684	6.0	32254	0.0000	0.0072	0.1424
4.0	31684	6.0	32844	0.0019	0.0056	0.0795
4.0	31684	6.0	34661	0.0113	0.0046	0.0543
4.0	31684	6.0	34974	0.0000	0.0018	0.0120
4.0	34067	6.0	12329	0.0002	0.0144	0.0005
4.0	34067	6.0	19602	0.0606	0.0345	0.0359
4.0	34067	6.0	24758	0.0427	0.0077	0.0003
4.0	34067	6.0	29586	0.0182	0.0206	0.0003
4.0	34067	6.0	32254	0.0454	0.0119	0.0782
4.0	34067	6.0	32844	0.0871	0.0081	0.0100
4.0	34067	6.0	34661	0.2014	0.0027	0.0481
4.0	34067	6.0	34974	0.0786	0.0534	0.0051
4.0	36759	6.0	12329	0.0030	0.0263	0.0004
4.0	36759	6.0	19602	0.0002	0.0026	0.0030
4.0	36759	6.0	24758	0.0480	0.1374	0.0000
4.0	36759	6.0	29586	0.0055	0.0088	0.0010
4.0	36759	6.0	32254	0.0971	0.0586	0.0004
4.0	36759	6.0	32844	0.0764	0.0001	0.0838
4.0	36759	6.0	34661	0.2536	0.0161	0.0010
4.0	36759	6.0	34974	0.0519	0.0038	0.1156
4.0	9544	7.0	24047	0.0	0.0046	0.0178
4.0	9544	7.0	28896	0.0	0.0004	0.1341
4.0	9544	7.0	32922	0.0	0.0135	0.0054

Appendix XV (Continued)

J1	LEVEL 1	J2	LEVEL 2	(U2)2	(U4)2	(U6)2
4.0	9544	7.0	36295	0.0	0.0214	0.0124
4.0	23640	7.0	24047	0.0	0.0291	0.0002
4.0	23640	7.0	28896	0.0	0.0161	0.2247
4.0	23640	7.0	32922	0.0	0.0357	0.0082
4.0	23640	7.0	36295	0.0	0.0041	0.1053
4.0	26552	7.0	24047	0.0	0.0182	0.0021
4.0	26552	7.0	28896	0.0	0.0552	0.0383
4.0	26552	7.0	32922	0.0	0.0935	0.0019
4.0	26552	7.0	36295	0.0	0.0603	0.1184
4.0	29445	7.0	24047	0.0	0.0536	0.4445
4.0	29445	7.0	28896	0.0	0.0057	0.2030
4.0	29445	7.0	32922	0.0	0.0395	0.0327
4.0	29445	7.0	36295	0.0	0.0118	0.0672
4.0	29928	7.0	24047	0.0	0.2469	0.0406
4.0	29928	7.0	28396	0.0	0.0031	0.3993
4.0	29928	7.0	32922	0.0	0.3163	0.0010
4.0	29928	7.0	36295	0.0	0.1338	0.0248
4.0	31684	7.0	24047	0.0	0.0338	0.0593
4.0	31684	7.0	28896	0.0	0.0005	0.0444
4.0	31684	7.0	32922	0.0	0.0048	0.0011
4.0	31684	7.0	36295	0.0	0.0776	0.1730
4.0	34067	7.0	24047	0.0	0.0905	0.0024
4.0	34067	7.0	28896	0.0	0.0053	0.0044
4.0	34067	7.0	32922	0.0	0.1524	0.0419
4.0	34067	7.0	36295	0.0	0.0323	0.0010
4.0	36759	7.0	24047	0.0	0.1095	0.0159
4.0	36759	7.0	28896	0.0	0.0436	0.0073
4.0	36759	7.0	32922	0.0	0.0020	0.0059
4.0	36759	7.0	36295	0.0	0.0174	0.0617
4.0	9544	8.0	26782	0.0	0.0003	0.0690
4.0	9544	8.0	32715	0.0	0.0036	0.0045
4.0	9544	8.0	33422	0.0	0.0204	0.0302
4.0	23640	8.0	26782	0.0	0.0101	0.4024
4.0	23640	8.0	32715	0.0	0.0008	0.0445
4.0	23640	8.0	33422	0.0	0.0788	0.0711
4.0	26552	8.0	26782	0.0	0.4178	0.0523
4.0	26552	8.0	32715	0.0	0.0380	0.0403
4.0	26552	8.0	33422	0.0	0.2971	0.0256
4.0	29445	8.0	26782	0.0	0.0000	0.0058
4.0	29445	8.0	32715	0.0	0.0184	0.0185
4.0	29445	8.0	33422	0.0	0.0034	0.0000
4.0	29928	8.0	26782	0.0	0.0004	0.0184
4.0	29928	8.0	32715	0.0	0.0033	0.0788
4.0	29928	8.0	33422	0.0	0.0014	0.0043
4.0	31684	8.0	26782	0.0	0.0000	0.0154
4.0	31684	8.0	32715	0.0	0.0960	0.0007
4.0	31684	8.0	33422	0.0	0.0027	0.1886
4.0	34067	8.0	26782	0.0	0.0192	0.1828
4.0	34067	8.0	32715	0.0	0.0039	0.0519

Appendix XV (Continued)

J1	LEVEL 1	J2	LEVEL 2	(U2)2	(U4)2	(U6)2
4.0	34067	8.0	33422	0.0	0.0776	0.0882
4.0	36759	8.0	26782	0.0	0.0000	0.0213
4.0	36759	8.0	32715	0.0	0.0967	0.0371
4.0	36759	8.0	33422	0.0	0.0022	0.0000
4.0	9544	9.0	28441	0.0	0.0	0.0254
4.0	23640	9.0	28441	0.0	0.0	0.2382
4.0	26552	9.0	28441	0.0	0.0	0.3382
4.0	29445	9.0	28441	0.0	0.0	0.0000
4.0	29928	9.0	28441	0.0	0.0	0.0686
4.0	31684	9.0	28441	0.0	0.0	0.0240
4.0	34067	9.0	28441	0.0	0.0	0.0408
4.0	36759	9.0	28441	0.0	0.0	0.0301
4.0	9544	10.0	28399	0.0	0.0	0.0521
4.0	9544	10.0	35371	0.0	0.0	0.0036
4.0	23640	10.0	28399	0.0	0.0	0.0236
4.0	23640	10.0	35371	0.0	0.0	0.1193
4.0	26552	10.0	28399	0.0	0.0	0.0940
4.0	26552	10.0	35371	0.0	0.0	0.0069
4.0	29445	10.0	28399	0.0	0.0	0.0751
4.0	29445	10.0	35371	0.0	0.0	0.0617
4.0	29928	10.0	28399	0.0	0.0	0.0019
4.0	29928	10.0	35371	0.0	0.0	0.0036
4.0	31684	10.0	28399	0.0	0.0	0.7632
4.0	31684	10.0	35371	0.0	0.0	0.0228
4.0	34067	10.0	28399	0.0	0.0	0.0809
4.0	34067	10.0	35371	0.0	0.0	0.0084
4.0	36759	10.0	28399	0.0	0.0	0.0039
4.0	36759	10.0	35371	0.0	0.0	0.0319
5.0	11191	5.0	11191	0.2084	0.1990	0.2326
5.0	11191	5.0	23349	0.0216	0.0034	0.0223
5.0	11191	5.0	27608	0.0000	0.0004	0.0001
5.0	11191	5.0	29654	0.0078	0.0012	0.0001
5.0	11191	5.0	29905	0.0002	0.0018	0.0894
5.0	11191	5.0	33487	0.0014	0.0000	0.0006
5.0	11191	5.0	34753	0.0077	0.0599	0.0004
5.0	23349	5.0	23349	0.0010	0.0423	0.0579
5.0	23349	5.0	27608	0.0084	0.0008	0.0136
5.0	23349	5.0	29654	0.0000	0.1035	0.1453
5.0	23349	5.0	29905	0.0427	0.1041	0.1868
5.0	23349	5.0	33487	0.0067	0.0017	0.0665
5.0	23349	5.0	34753	0.1139	0.1988	0.0125
5.0	27608	5.0	27608	0.0138	0.0063	0.0101
5.0	27608	5.0	29654	0.0000	0.0138	0.0997
5.0	27608	5.0	29905	0.0060	0.1223	0.0310
5.0	27608	5.0	33487	0.0082	0.0272	0.0024
5.0	27608	5.0	34753	0.4420	0.1282	0.0237
5.0	29654	5.0	29654	0.0629	0.0727	0.0136
5.0	29654	5.0	29905	0.0243	0.0026	0.0704
5.0	29654	5.0	33487	0.0103	0.0227	0.0517

Appendix XV (Continued)

J1	LEVEL 1	J2	LEVEL 2	(U2)2	(U4)2	(U6)2
5.0	29654	5.0	34753	0.0034	0.1774	0.0053
5.0	29905	5.0	29905	0.1026	0.0221	0.1139
5.0	29905	5.0	33487	0.0529	0.0053	0.0039
5.0	29905	5.0	34753	0.0057	0.0008	0.0257
5.0	33487	5.0	33487	0.0052	0.0005	0.0634
5.0	33487	5.0	34753	0.0088	0.0815	0.0618
5.0	34753	5.0	34753	0.0068	0.0012	0.0100
5.0	11191	6.0	12329	0.5625	0.5848	0.0848
5.0	11191	6.0	19602	0.0015	0.0014	0.0001
5.0	11191	6.0	24758	0.0005	0.0036	0.0119
5.0	11191	6.0	29586	0.0209	0.0227	0.0072
5.0	11191	6.0	32254	0.0006	0.0037	0.0527
5.0	11191	6.0	32844	0.0000	0.0084	0.0449
5.0	11191	6.0	34661	0.0124	0.0130	0.0349
5.0	11191	6.0	34974	0.0057	0.0266	0.0003
5.0	23349	6.0	12329	0.0004	0.0005	0.0000
5.0	23349	6.0	19602	0.4463	0.3746	0.0646
5.0	23349	6.0	24758	0.0023	0.0899	0.0000
5.0	23349	6.0	29586	0.0364	0.0431	0.0000
5.0	23349	6.0	32254	0.0183	0.0330	0.0787
5.0	23349	6.0	32844	0.0204	0.0365	0.0016
5.0	23349	6.0	34661	0.0000	0.0058	0.0228
5.0	23349	6.0	34974	0.0179	0.0031	0.0115
5.0	27608	6.0	12329	0.1140	0.0210	0.0033
5.0	27608	6.0	19602	0.7694	0.1432	0.0248
5.0	27608	6.0	24758	0.0257	0.0077	0.0083
5.0	27608	6.0	29586	0.0656	0.0385	0.0007
5.0	27608	6.0	32254	0.0016	0.0324	0.0037
5.0	27608	6.0	32844	0.0305	0.0301	0.0177
5.0	27608	6.0	34661	0.0000	0.0278	0.0061
5.0	27608	6.0	34974	0.0541	0.0198	0.0101
5.0	29654	6.0	12329	0.0183	0.0076	0.0001
5.0	29654	6.0	19602	0.0517	0.0390	0.0094
5.0	29654	6.0	24758	0.9201	0.1722	0.0014
5.0	29654	6.0	29586	0.0040	0.0462	0.0812
5.0	29654	6.0	32254	0.0286	0.0061	0.1336
5.0	29654	6.0	32844	0.0019	0.0600	0.2608
5.0	29654	6.0	34661	0.0692	0.0142	0.0468
5.0	29654	6.0	34974	0.0725	0.0002	0.0243
5.0	29905	6.0	12329	0.0004	0.0048	0.0002
5.0	29905	6.0	19602	0.0971	0.0875	0.0018
5.0	29905	6.0	24758	0.0290	0.0433	0.0886
5.0	29905	6.0	29586	0.4015	0.0004	0.1364
5.0	29905	6.0	32254	0.0470	0.0639	0.0499
5.0	29905	6.0	32844	0.0104	0.0122	0.0074
5.0	29905	6.0	34661	0.0277	0.0053	0.0689
5.0	29905	6.0	34974	0.1008	0.1727	0.0341
5.0	33487	6.0	12329	0.0014	0.0194	0.1036
5.0	33487	6.0	19602	0.0374	0.1351	0.1087

Appendix XV (Continued)

J1	LEVEL 1	J2	LEVEL 2	(U2)2	(U4)2	(U6)2
5.0	33487	6.0	24758	0.0092	0.0013	0.5218
5.0	33487	6.0	29586	0.0003	0.0187	0.0278
5.0	33487	6.0	32254	0.0050	0.0706	0.0170
5.0	33487	6.0	32844	0.2951	0.0298	0.0267
5.0	33487	6.0	34661	0.0042	0.0093	0.0000
5.0	33487	6.0	34974	0.0004	0.0153	0.0050
5.0	34753	6.0	12329	0.0108	0.0043	0.0010
5.0	34753	6.0	19602	0.0611	0.0036	0.0000
5.0	34753	6.0	24758	0.0234	0.0540	0.0039
5.0	34753	6.0	29586	0.4315	0.0024	0.0029
5.0	34753	6.0	32254	0.0269	0.0043	0.0409
5.0	34753	6.0	32844	0.0220	0.0285	0.1232
5.0	34753	6.0	34661	0.0201	0.0361	0.1046
5.0	34753	6.0	34974	0.0070	0.0498	0.0000
5.0	11191	7.0	24047	0.0000	0.0278	0.0508
5.0	11191	7.0	28896	0.0023	0.0044	0.0002
5 0	11191	7.0	32922	0.0071	0.0643	0.1255
5.0	11191	7.0	36295	0.0057	0.0000	0.0004
5.0	23349	7.0	24047	0.1060	0.1706	0.1245
5.0	23349	7.0	28896	0.0035	0.0178	0.0022
5.0	23349	7.0	32922	0.0839	0.3123	0.1800
5.0	23349	7.0	36295	0.0008	0.0059	0.0934
5.0	27608	7.0	24047	0.0568	0.0037	0.0502
5.0	27608	7.0	28896	0.0868	0.0030	0.0112
5.0	27608	7.0	32922	0.0343	0.0188	0.2665
5.0	27608	7.0	36295	0.0004	0.0366	0.0000
5.0	29654	7.0	24047	0.1346	0.1237	0.0096
5.0	29654	7.0	28896	0.0020	0.0068	0.0138
5.0	29654	7.0	32922	0.0103	0.0908	0.0675
5.0	29654	7.0	36295	0.0239	0.0004	0.0786
5.0	29905	7.0	24047	0.0837	0.0381	0.0545
5.0	29905	7.0	28896	0.0197	0.0773	0.0041
5.0	29905	7.0	32922	0.0076	0.0637	0.1022
5.0	29905	7.0	36295	0.0184	0.0866	0.1366
5.0	33487	7.0	24047	0.0174	0.0590	0.3416
5.0	33487	7.0	28896	0.0173	0.1283	0.0051
5.0	33487	7.0	32922	0.1327	0.0024	0.1072
5.0	33487	7.0	36295	0.0298	0.0136	0.0189
5.0	34753	7.0	24047	0.0083	0.0001	0.0006
5.0	34753	7.0	28896	0.3012	0.1395	0.0197
5.0	34753	7.0	32922	0.1510	0.0003	0.0161
5.0	34753	7.0	36295	0.0042	0.0020	0.0119
5.0	11191	8.0	26782	0.0	0.0066	0.0559
5.0	11191	8.0	32715	0.0	0.0009	0.1875
5.0	11191	8.0	33422	0.0	0.0384	0.0122
5.0	23349	8.0	26782	0.0	0.0050	0.0020
5.0	23349	8.0	32715	0.0	0.0533	0.1305
5.0	23349	8.0	33422	0.0	0.0011	0.0000
5.0	27608	8.0	26782	0.0	0.0004	0.0149

Appendix XV (Continued)

J1	LEVEL 1	J2	LEVEL 2	(U2)2	(U4)2	(U6)2
5.0	27608	8.0	32715	0.0	0.1176	0.0049
5.0	27608	8.0	33422	0.0	0.0984	0.1243
5.0	29654	8.0	26782	0.0	0.0304	0.2692
5.0	29654	8.0	32715	0.0	0.0004	0.2966
5.0	29654	8.0	33422	0.0	0.0661	0.0618
5.0	29905	8.0	26782	0.0	0.0323	0.3801
5.0	29905	8.0	32715	0.0	0.0066	0.0473
5.0	29905	8.0	33422	0.0	0.3751	0.0285
5.0	33487	8.0	26782	0.0	0.1224	0.0093
5.0	33487	8.0	32715	0.0	0.0021	0.1677
5.0	33487	8.0	33422	0.0	0.0041	0.0589
5.0	34753	8.0	26782	0.0	0.1015	0.0015
5.0	34753	8.0	32715	0.0	0.0497	0.0281
5.0	34753	8.0	33422	0.0	0.0931	0.0463
5.0	11191	9.0	28441	0.0	0.0001	0.1977
5.0	23349	9.0	28441	0.0	0.1012	0.6300
5.0	27608	9.0	28441	0.0	0.6261	0.0274
5.0	29654	9.0	28441	0.0	0.0266	0.1045
5.0	29905	9.0	28441	0.0	0.0211	0.0010
5.0	33487	9.0	28441	0.0	0.0117	0.0416
5.0	34753	9.0	28441	0.0	0.0004	0.1505
5.0	11191	10.0	28399	0.0	0.0	0.0119
5.0	11191	10.0	35371	0.0	0.0	0.0020
5.0	23349	10.0	28399	0.0	0.0	0.2666
5.0	23349	10.0	35371	0.0	0.0	0.0478
5.0	27608	10.0	28399	0.0	0.0	0.2026
5.0	27608	10.0	35371	0.0	0.0	0.3224
5.0	29654	10.0	28399	0.0	0.0	0.0087
5.0	29654	10.0	35371	0.0	0.0	0.0012
5.0	29905	10.0	28399	0.0	0.0	0.0399
5.0	29905	10.0	35371	0.0	0.0	0.0000
5.0	33487	10.0	28399	0.0	0.0	0.0501
5.0	33487	10.0	35371	0.0	0.0	0.0000
5.0	34753	10.0	28399	0.0	0.0	0.2322
5.0	34753	10.0	35371	0.0	0.0	0.0000
6.0	12329	6.0	12329	0.8352	0.2594	0.0135
6.0	12329	6.0	19602	0.0733	0.0468	0.0094
6.0	12329	6.0	24758	0.0667	0.0085	0.0000
6.0	12329	6.0	29586	0.0019	0.0168	0.0248
6.0	12329	6.0	32254	0.0097	0.0033	0.0883
6.0	12329	6.0	32844	0.0002	0.0019	0.1284
6.0	12329	6.0	34661	0.0262	0.0017	0.0279
6.0	12329	6.0	34974	0.0008	0.0201	0.0030
6.0	19602	6.0	19602	0.0032	0.2334	0.0775
6.0	19602	6.0	24758	0.0123	0.2547	0.0328
6.0	19602	6.0	29586	0.1001	0.0586	0.0590
6.0	19602	6.0	32254	0.0027	0.0401	0.1594
6.0	19602	6.0	32844	0.0001	0.0000	0.5754
6.0	19602	6.0	34661	0.0223	0.0047	0.0218

Appendix XV (Continued)

J1	LEVEL 1	J2	LEVEL 2	(U2)2	(U4)2	(U6)2
6.0	19602	6.0	34974	0.0527	0.0000	0.0286
6.0	24758	6.0	24758	0.0077	0.0384	0.0004
6.0	24758	6.0	29586	0.0002	0.0667	0.0233
6.0	24758	6.0	32254	0.0644	0.0037	0.0184
6.0	24758	6.0	32844	0.1564	0.0467	0.0014
6.0	24758	6.0	34661	0.0002	0.0001	0.0040
6.0	24758	6.0	34974	0.0828	0.2647	0.0413
6.0	29586	6.0	29586	0.0007	0.3238	0.0073
6.0	29586	6.0	32254	0.0460	0.0021	0.0521
6.0	29586	6.0	32844	0.0150	0.0556	0.0162
6.0	29586	6.0	34661	0.0234	0.0276	0.0539
6.0	29586	6.0	34974	0.0727	0.0283	0.0220
6.0	32254	6.0	32254	0.0572	0.1111	0.2414
6.0	32254	6.0	32844	0.0026	0.0052	0.0031
6.0	32254	6.0	34661	0.0011	0.0674	0.0092
6.0	32254	6.0	34974	0.0927	0.0141	0.0028
6.0	32844	6.0	32844	0.0051	0.1133	0.1049
6.0	32844	6.0	34661	0.0000	0.0197	0.0992
6.0	32844	6.0	34974	0.0413	0.0007	0.0091
6.0	34661	6.0	34661	0.0015	0.1125	0.0259
6.0	34661	6.0	34974	0.0202	0.0662	0.0743
6.0	34974	6.0	34974	0.0133	0.0530	0.1979
6.0	12329	7.0	24047	0.0104	0.0133	0.0063
6.0	12329	7.0	28896	0.0080	0.0667	0.0005
6.0	12329	7.0	32922	0.0016	0.0000	0.0000
6.0	12329	7.0	36295	0.0032	0.0099	0.1707
6.0	19602	7.0	24047	0.0749	0.0347	0.0236
6.0	19602	7.0	28896	0.0097	0.1657	0.0059
6.0	19602	7.0	32922	0.0000	0.0038	0.0008
6.0	19602	7.0	36295	0.0000	0.0060	0.1005
6.0	24758	7.0	24047	0.0022	0.3043	0.0913
6.0	24758	7.0	28896	0.0037	0.0186	0.0244
6.0	24758	7.0	32922	0.0079	0.0191	0.0677
6.0	24758	7.0	36295	0.0007	0.0137	0.1810
6.0	29586	7.0	24047	0.5959	0.1822	0.0213
6.0	29586	7.0	28896	0.0001	0.0004	0.0183
6.0	29586	7.0	32922	0.1943	0.0148	0.0002
6.0	29586	7.0	36295	0.0124	0.0090	0.3543
6.0	32254	7.0	24047	0.2303	0.0006	0.2844
6.0	32254	7.0	28896	0.0000	0.0448	0.1062
6.0	32254	7.0	32922	0.1591	0.0736	0.0906
6.0	32254	7.0	36295	0.1667	0.0513	0.0089
6.0	32844	7.0	24047	0.6925	0.1423	0.0027
6.0	32844	7.0	28896	0.0592	0.0315	0.1363
6.0	32844	7.0	32922	0.1461	0.0483	0.1683
6.0	32844	7.0	36295	0.0266	0.0034	0.0404
6.0	34661	7.0	24047	0.0034	0.0153	0.0224
6.0	34661	7.0	28896	0.3668	0.0134	0.0193
6.0	34661	7.0	32922	0.0054	0.0067	0.0288

Appendix XV (Continued)

J1	LEVEL 1	J2	LEVEL 2	(U2)2	(U4)2	(U6)2
6.0	34661	7.0	36295	0.0147	0.1969	0.0924
6.0	34974	7.0	24047	0.0483	0.0226	0.0028
6.0	34974	7.0	28896	0.3718	0.0383	0.0006
6.0	34974	7.0	32922	0.1880	0.0292	0.0002
6.0	34974	7.0	36295	0.0035	0.0229	0.2155
6.0	12329	8.0	26782	0.0116	0.0546	0.0894
6.0	12329	8.0	32715	0.0173	0.0893	0.0893
6.0	12329	8.0	33422	0.0026	0.0468	0.1659
6.0	19602	8.0	26782	0.0873	0.1529	0.1861
6.0	19602	8.0	32715	0.0028	0.0057	0.1116
6.0	19602	8.0	33422	0.0076	0.0296	0.6605
6.0	24758	8.0	26782	0.0918	0.0609	0.0000
6.0	24758	8.0	32715	0.0485	0.0971	0.1531
6.0	24758	8.0	33422	0.0422	0.1106	0.0402
6.0	29586	8.0	26782	0.1148	0.0577	0.0377
6.0	29586	8.0	32715	0.0549	0.2633	0.0179
6.0	29586	8.0	33422	0.0148	0.0306	0.0416
6.0	32254	8.0	26782	0.0000	0.0425	0.2835
6.0	32254	8.0	32715	0.0325	0.0224	0.0208
6.0	32254	8.0	33422	0.2139	0.0032	0.1369
6.0	32844	8.0	26782	0.0518	0.0141	0.0088
6.0	32844	8.0	32715	0.0250	0.0001	0.0294
6.0	32844	8.0	33422	0.0064	0.0661	0.0612
6.0	34661	8.0	26782	0.1714	0.0469	0.0206
6.0	34661	8.0	32715	0.0290	0.1090	0.0512
6.0	34661	8.0	33422	0.0036	0.0007	0.3063
6.0	34974	8.0	26782	0.0720	0.2222	0.0273
6.0	34974	8.0	32715	0.0275	0.0000	0.0017
6.0	34974	8.0	33422	0.0073	0.0426	0.1120
6.0	12329	9.0	28441	0.0	0.0187	0.0876
6.0	19602	9.0	28441	0.0	0.0195	0.0364
6.0	24758	9.0	28441	0.0	0.0609	0.0394
6.0	29586	9.0	28441	0.0	0.0000	0.5174
6.0	32254	9.0	28441	0.0	0.1865	0.0174
6.0	32844	9.0	28441	0.0	0.0097	0.1953
6.0	34661	9.0	28441	0.0	0.1869	0.0047
6.0	34974	9.0	28441	0.0	0.0113	0.0362
6.0	12329	10.0	28399	0.0	0.0438	0.6093
6.0	12329	10.0	35371	0.0	0.0016	0.0076
6.0	19602	10.0	28399	0.0	0.0852	0.7335
6.0	19602	10.0	35371	0.0	0.0297	0.6493
6.0	24758	10.0	28399	0.0	0.2171	0.6628
6.0	24758	10.0	35371	0.0	0.0108	0.0581
6.0	29586	10.0	28399	0.0	0.0234	0.0990
6.0	29586	10.0	35371	0.0	0.0416	0.0434
6.0	32254	10.0	28399	0.0	0.1531	0.0256
6.0	32254	10.0	35371	0.0	0.0247	0.1201
6.0	32844	10.0	28399	0.0	0.0000	0.0000
6.0	32844	10.0	35371	0.0	0.0002	0.0629

Appendix XV (Continued)

J1	LEVEL 1	J2	LEVEL 2	(U2)2	(U4)2	(U6)2
6.0	34661	10.0	28399	0.0	0.1758	0.0090
6.0	34661	10.0	35371	0.0	0.0358	0.3972
6.0	34974	10.0	28399	0.0	0.0766	0.0011
6.0	34974	10.0	35371	0.0	0.1987	0.6311
7.0	24047	7.0	24047	0.0720	0.2264	0.0088
7.0	24047	7.0	28896	0.0122	0.3518	0.0040
7.0	24047	7.0	32922	0.0862	0.0583	0.0174
7.0	24047	7.0	36295	0.0041	0.0006	0.4845
7.0	28896	7.0	28896	0.0794	0.1293	0.0651
7.0	28896	7.0	32922	0.0937	0.0612	0.0028
7.0	28896	7.0	36295	0.1650	0.1181	0.0000
7.0	32922	7.0	32922	0.0000	0.2792	0.0195
7.0	32922	7.0	36295	0.0107	0.1016	0.0014
7.0	36295	7.0	36295	0.0011	0.0782	0.0136
7.0	24047	8.0	26782	0.1496	0.2031	0.0561
7.0	24047	8.0	32715	0.0006	0.0542	0.0684
7.0	24047	8.0	33422	0.0002	0.0083	0.0210
7.0	28896	8.0	26782	0.0236	0.1761	0.0199
7.0	28896	8.0	32715	0.0210	0.0096	0.2410
7.0	28896	8.0	33422	0.0409	0.0575	0.0364
7.0	32922	8.0	26782	0.8570	0.1577	0.2163
7.0	32922	8.0	32715	0.1333	0.0422	0.0675
7.0	32922	8.0	33422	0.3115	0.0656	0.1603
7.0	36295	8.0	26782	0.6135	0.1464	0.0760
7.0	36295	8.0	32715	0.0000	0.0000	0.2715
7.0	36295	8.0	33422	0.0649	0.2586	0.0168
7.0	24047	9.0	28441	0.0992	0.2203	0.0488
7.0	28896	9.0	28441	0.3248	0.1074	0.1066
7.0	32922	9.0	28441	0.0933	0.0042	0.2296
7.0	36295	9.0	28441	0.0680	0.0003	0.0933
7.0	24047	10.0	28399	0.0	0.0532	0.2043
7.0	24047	10.0	35371	0.0	0.0000	0.0968
7.0	28896	10.0	28399	0.0	0.2694	0.3496
7.0	28896	10.0	35371	0.0	0.1728	0.2425
7.0	32922	10.0	28399	0.0	0.4637	0.0044
7.0	32922	10.0	35371	0.0	0.0214	0.0076
7.0	36295	10.0	28399	0.0	0.1043	0.0192
7.0	36295	10.0	35371	0.0	0.0133	0.0171
8.0	26782	8.0	26782	0.0675	0.3249	0.0289
8.0	26782	8.0	32715	0.0032	0.2702	0.1737
8.0	26782	8.0	33422	0.1337	0.0867	0.0235
8.0	32715	8.0	32715	0.3197	0.0153	0.0971
8.0	32715	8.0	33422	0.0009	0.2344	0.0270
8.0	33422	8.0	33422	0.2740	0.0729	0.0006
8.0	26782	9.0	28441	0.1917	0.4549	0.0134
8.0	32715	9.0	28441	0.0038	0.0046	0.4516
8.0	33422	9.0	28441	1.1604	0.1101	0.0000
8.0	26782	10.0	28399	0.0355	0.1393	0.1262
8.0	26782	10.0	35371	0.0273	0.0129	0.3842

Appendix XV (Continued)

J1	LEVEL 1	J2	LEVEL 2	(U2)2	(U4)2	(U6)2
8.0	32715	10.0	28399	0.4036	0.0051	0.2427
8.0	32715	10.0	35371	0.0561	0.0336	0.1180
8.0	33422	10.0	28399	0.1962	0.0867	0.0939
8.0	33422	10.0	35371	0.0241	0.3650	0 0105
9.0	28441	9.0	28441	0.0815	0.5793	0.0000
9.0	28441	10.0	28399	0.3237	0.4209	0.2667
9.0	28441	10.0	35371	0.0000	0.0002	0.0037
10.0	28399	10.0	28399	0.0371	0.9554	0.0407
10.0	28399	10.0	35371	0.0607	0.2856	0.2923
10.0	35371	10.0	35371	0.3266	0.0263	0.3163

Appendix XVI
Matrix Elements of (Uλ)2 for Cm^{3+}:$LaCl_3$ with Ground State, J1 = 3.5

J2	LEVEL	(U2)2	(U4)2	(U6)2
3.5	16953	0.0274	0.0084	0.0055
2.5	20208	0.0108	0.0002	0.0001
3.5	21777	0.0057	0.0005	0.0335
1.5	22440	0.0000	0.0001	0.0
4.5	22949	0.0115	0.0175	0.0613
8.5	25038	0.0	0.0	0.1996
5.5	25165	0.0002	0.0074	0.1355
4.5	25933	0.0233	0.0126	0.0298
6.5	26085	0.0	0.0063	0.1832
7.5	26483	0.0	0.0011	0.2106
3.5	28078	0.0191	0.0088	0.0001
2.5	29729	0.0001	0.0109	0.0013
0.5	29921	0.0	0.0001	0.0
3.5	30173	0.0038	0.0148	0.0064
2.5	30644	0.0137	0.0015	0.0002
1.5	30660	0.0058	0.0000	0.0
5.5	31043	0.0023	0.0929	0.0085
4.5	32073	0.0085	0.0475	0.0009
1.5	32251	0.0005	0.0022	0.0
6.5	34205	0.0	0.0796	0.0054
8.5	35348	0.0	0.0	0.0023
5.5	35445	0.0004	0.0201	0.0002
3.5	35520	0.0028	0.0185	0.0000
0.5	35665	0.0	0.0018	0.0
6.5	35774	0.0	0.0005	0.0001
4.5	35794	0.0003	0.0048	0.0034
3.5	36547	0.0006	0.0013	0.0007
2.5	37639	0.0004	0.0024	0.0012
1.5	38777	0.0000	0.0057	0.0
7.5	38860	0.0	0.0044	0.0010
2.5	39036	0.0001	0.0105	0.0000
4.5	39125	0.0000	0.0173	0.0008
6.5	39219	0.0	0.0032	0.0001
5.5	39998	0.0003	0.0000	0.0008

Appendix XVI (Continued)
Matrix Elements of (Uλ)2 for Cm^{3+}:$LaCl_3$ (to 40000 cm^{-1})

J1	LEVEL 1	J2	LEVEL 2	(U2)2	(U4)2	(U6)2
0.5	29921	1.5	22440	0.0001	0.0	0.0
0.5	29921	1.5	30660	0.0354	0.0	0.0
0.5	29921	1.5	32251	0.0033	0.0	0.0
0.5	29921	1.5	38777	0.0786	0.0	0.0
0.5	35665	1.5	22440	0.0323	0.0	0.0
0.5	35665	1.5	30660	0.0340	0.0	0.0
0.5	35665	1.5	32251	0.1839	0.0	0.0
0.5	35665	1.5	38777	0.0045	0.0	0.0
0.5	29921	2.5	20208	0.0097	0.0	0.0
0.5	29921	2.5	29729	0.0852	0.0	0.0
0.5	29921	2.5	30644	0.0586	0.0	0.0
0.5	29921	2.5	37639	0.0363	0.0	0.0
0.5	29921	2.5	39036	0.0600	0.0	0.0
0.5	35665	2.5	20208	0.0000	0.0	0.0
0.5	35665	2.5	29729	0.0865	0.0	0.0
0.5	35665	2.5	30644	0.0645	0.0	0.0
0.5	35665	2.5	37639	0.0572	0.0	0.0
0.5	35665	2.5	39036	0.0713	0.0	0.0
0.5	29921	3.5	7	0.0	0.0001	0.0
0.5	29921	3.5	16953	0.0	0.0005	0.0
0.5	29921	3.5	21777	0.0	0.0071	0.0
0.5	29921	3.5	28078	0.0	0.0038	0.0
0.5	29921	3.5	30173	0.0	0.0338	0.0
0.5	29921	3.5	35520	0.0	0.0112	0.0
0.5	29921	3.5	36547	0.0	0.0949	0.0
0.5	35665	3.5	7	0.0	0.0018	0.0
0.5	35665	3.5	16953	0.0	0.0630	0.0
0.5	35665	3.5	21777	0.0	0.0049	0.0
0.5	35665	3.5	28078	0.0	0.0176	0.0
0.5	35665	3.5	30173	0.0	0.0655	0.0
0.5	35665	3.5	35520	0.0	0.0745	0.0
0.5	35665	3.5	36547	0.0	0.0330	0.0
0.5	29921	4.5	22949	0.0	0.0000	0.0
0.5	29921	4.5	25933	0.0	0.0519	0.0
0.5	29921	4.5	32073	0.0	0.0064	0.0
0.5	29921	4.5	35794	0.0	0.0869	0.0
0.5	29921	4.5	39125	0.0	0.0308	0.0
0.5	35665	4.5	22949	0.0	0.0801	0.0
0.5	35665	4.5	25933	0.0	0.0150	0.0
0.5	35665	4.5	32073	0.0	0.0261	0.0
0.5	35665	4.5	35794	0.0	0.0339	0.0
0.5	35665	4.5	39125	0.0	0.0035	0.0
0.5	29921	5.5	25165	0.0	0.0	0.0189
0.5	29921	5.5	31043	0.0	0.0	0.0047
0.5	29921	5.5	35445	0.0	0.0	0.0061
0.5	29921	5.5	39998	0.0	0.0	0.0060

Appendix XVI (Continued)

J1	LEVEL 1	J2	LEVEL 2	(U2)2	(U4)2	(U6)2
0.5	35665	5.5	25165	0.0	0.0	0.2984
0.5	35665	5.5	31043	0.0	0.0	0.0093
0.5	35665	5.5	35445	0.0	0.0	0.0091
0.5	35665	5.5	39998	0.0	0.0	0.0030
0.5	29921	6.5	26085	0.0	0.0	0.0012
0.5	29921	6.5	34205	0.0	0.0	0.0288
0.5	29921	6.5	35774	0.0	0.0	0.0313
0.5	29921	6.5	39219	0.0	0.0	0.0221
0.5	35665	6.5	26085	0.0	0.0	0.1981
0.5	35665	6.5	34205	0.0	0.0	0.0022
0.5	35665	6.5	35774	0.0	0.0	0.0004
0.5	35665	6.5	39219	0.0	0.0	0.0378
1.5	22440	1.5	22440	0.0171	0.0	0.0
1.5	22440	1.5	30660	0.0007	0.0	0.0
1.5	22440	1.5	32251	0.0385	0.0	0.0
1.5	22440	1.5	38777	0.0110	0.0	0.0
1.5	30660	1.5	30660	0.1461	0.0	0.0
1.5	30660	1.5	32251	0.0262	0.0	0.0
1.5	30660	1.5	38777	0.0068	0.0	0.0
1.5	32251	1.5	32251	0.1005	0.0	0.0
1.5	32251	1.5	38777	0.0322	0.0	0.0
1.5	38777	1.5	38777	0.3310	0.0	0.0
1.5	22440	2.5	20208	0.1185	0.0108	0.0
1.5	22440	2.5	29729	0.0083	0.0022	0.0
1.5	22440	2.5	30644	0.0477	0.0065	0.0
1.5	22440	2.5	37639	0.0001	0.0810	0.0
1.5	22440	2.5	39036	0.0018	0.0012	0.0
1.5	30660	2.5	20208	0.0306	0.0106	0.0
1.5	30660	2.5	29729	0.0128	0.1069	0.0
1.5	30660	2.5	30644	0.0093	0.0215	0.0
1.5	30660	2.5	37639	0.0324	0.0207	0.0
1.5	30660	2.5	39036	0.0368	0.0619	0.0
1.5	32251	2.5	20208	0.0018	0.0741	0.0
1.5	32251	2.5	29729	0.0348	0.0499	0.0
1.5	32251	2.5	30644	0.1370	0.0765	0.0
1.5	32251	2.5	37639	0.1287	0.0434	0.0
1.5	32251	2.5	39036	0.0666	0.0455	0.0
1.5	38777	2.5	20208	0.0084	0.0008	0.0
1.5	38777	2.5	29729	0.0003	0.0056	0.0
1.5	38777	2.5	30644	0.0279	0.1125	0.0
1.5	38777	2.5	37639	0.2737	0.0702	0.0
1.5	38777	2.5	39036	0.0431	0.0096	0.0
1.5	22440	3.5	7	0.0000	0.0001	0.0
1.5	22440	3.5	16953	0.0299	0.0186	0.0
1.5	22440	3.5	21777	0.0054	0.0096	0.0
1.5	22440	3.5	28078	0.1563	0.1006	0.0
1.5	22440	3.5	30173	0.0007	0.0307	0.0
1.5	22440	3.5	35520	0.0008	0.0473	0.0
1.5	22440	3.5	36547	0.0120	0.0238	0.0

Appendix XVI (Continued)

J1	LEVEL 1	J2	LEVEL 2	(U2)2	(U4)2	(U6)2
1.5	30660	3.5	7	0.0058	0.0000	0.0
1.5	30660	3.5	16953	0.0031	0.0039	0.0
1.5	30660	3.5	21777	0.0113	0.0376	0.0
1.5	30660	3.5	28078	0.0385	0.0337	0.0
1.5	30660	3.5	30173	0.0685	0.0039	0.0
1.5	30660	3.5	35520	0.0846	0.0447	0.0
1.5	30660	3.5	36547	0.0774	0.0471	0.0
1.5	32251	3.5	7	0.0005	0.0022	0.0
1.5	32251	3.5	16953	0.0061	0.0000	0.0
1.5	32251	3.5	21777	0.0081	0.0166	0.0
1.5	32251	3.5	28078	0.0049	0.0595	0.0
1.5	32251	3.5	30173	0.0577	0.0117	0.0
1.5	32251	3.5	35520	0.0323	0.0048	0.0
1.5	32251	3.5	36547	0.2081	0.0209	0.0
1.5	38777	3.5	7	0.0000	0.0057	0.0
1.5	38777	3.5	16953	0.0003	0.0043	0.0
1.5	38777	3.5	21777	0.0000	0.1723	0.0
1.5	38777	3.5	28078	0.0004	0.0007	0.0
1.5	38777	3.5	30173	0.0377	0.0002	0.0
1.5	38777	3.5	35520	0.0812	0.0422	0.0
1.5	38777	3.5	36547	0.0098	0.0542	0.0
1.5	22440	4.5	22949	0.0	0.0340	0.1666
1.5	22440	4.5	25933	0.0	0.0340	0.0639
1.5	22440	4.5	32073	0.0	0.2848	0.0014
1.5	22440	4.5	35794	0.0	0.0077	0.0093
1.5	22440	4.5	39125	0.0	0.0191	0.0011
1.5	30660	4.5	22949	0.0	0.0023	0.0046
1.5	30660	4.5	25933	0.0	0.0000	0.0094
1.5	30660	4.5	32073	0.0	0.0111	0.0270
1.5	30660	4.5	35794	0.0	0.0006	0.0112
1.5	30660	4.5	39125	0.0	0.0914	0.0118
1.5	32251	4.5	22949	0.0	0.0247	0.2041
1.5	32251	4.5	25933	0.0	0.0292	0.0010
1.5	32251	4.5	32073	0.0	0.0002	0.0656
1.5	32251	4.5	35794	0.0	0.0002	0.0123
1.5	32251	4.5	39125	0.0	0.0742	0.0439
1.5	38777	4.5	22949	0.0	0.0041	0.0828
1.5	38777	4.5	25933	0.0	0.0135	0.1042
1.5	38777	4.5	32073	0.0	0.0921	0.0058
1.5	38777	4.5	35794	0.0	0.0041	0.0018
1.5	38777	4.5	39125	0.0	0.0178	0.0851
1.5	22440	5.5	25165	0.0	0.0259	0.2350
1.5	22440	5.5	31043	0.0	0.0707	0.0107
1.5	22440	5.5	35445	0.0	0.1857	0.0254
1.5	22440	5.5	39998	0.0	0.0779	0.0045
1.5	30660	5.5	25165	0.0	0.0164	0.1078
1.5	30660	5.5	31043	0.0	0.1260	0.0457
1.5	30660	5.5	35445	0.0	0.0241	0.0002
1.5	30660	5.5	39998	0.0	0.1620	0.0418

Appendix XVI (Continued)

J1	LEVEL 1	J2	LEVEL 2	(U2)2	(U4)2	(U6)2
1.5	32251	5.5	25165	0.0	0.0219	0.0413
1.5	32251	5.5	31043	0.0	0.0004	0.0421
1.5	32251	5.5	35445	0.0	0.0154	0.0003
1.5	32251	5.5	39998	0.0	0.0520	0.1967
1.5	38777	5.5	25165	0.0	0.0760	0.0018
1.5	38777	5.5	31043	0.0	0.0427	0.1175
1.5	38777	5.5	35445	0.0	0.0021	0.0033
1.5	38777	5.5	39998	0.0	0.0332	0.0000
1.5	22440	6.5	26085	0.0	0.0	0.2344
1.5	22440	6.5	34205	0.0	0.0	0.0255
1.5	22440	6.5	35774	0.0	0.0	0.0507
1.5	22440	6.5	39219	0.0	0.0	0.0031
1.5	30660	6.5	26085	0.0	0.0	0.2789
1.5	30660	6.5	34205	0.0	0.0	0.0351
1.5	30660	6.5	35774	0.0	0.0	0.0038
1.5	30660	6.5	39219	0.0	0.0	0.0048
1.5	32251	6.5	26085	0.0	0.0	0.0433
1.5	32251	6.5	34205	0.0	0.0	0.0000
1.5	32251	6.5	35774	0.0	0.0	0.0187
1.5	32251	6.5	39219	0.0	0.0	0.0054
1.5	38777	6.5	26085	0.0	0.0	0.3158
1.5	38777	6.5	34205	0.0	0.0	0.0332
1.5	38777	6.5	35774	0.0	0.0	0.0199
1.5	38777	6.5	39219	0.0	0.0	0.0046
1.5	22440	7.5	26483	0.0	0.0	0.3635
1.5	22440	7.5	38860	0.0	0.0	0.1336
1.5	30660	7.5	26483	0.0	0.0	0.1083
1.5	30660	7.5	38860	0.0	0.0	0.0415
1.5	32251	7.5	26483	0.0	0.0	0.0734
1.5	32251	7.5	38860	0.0	0.0	0.0155
1.5	38777	7.5	26483	0.0	0.0	0.1435
1.5	38777	7.5	38860	0.0	0.0	0.0035
2.5	20208	2.5	20208	0.1756	0.0945	0.0
2.5	20208	2.5	29729	0.0921	0.1944	0.0
2.5	20208	2.5	30644	0.0169	0.0031	0.0
2.5	20208	2.5	37639	0.0106	0.0042	0.0
2.5	20208	2.5	39036	0.0055	0.0046	0.0
2.5	29729	2.5	29729	0.4502	0.0082	0.0
2.5	29729	2.5	30644	0.0006	0.0002	0.0
2.5	29729	2.5	37639	0.0016	0.0486	0.0
2.5	29729	2.5	39036	0.0005	0.0001	0.0
2.5	30644	2.5	30644	0.0073	0.0231	0.0
2.5	30644	2.5	37639	0.0529	0.0315	0.0
2.5	30644	2.5	39036	0.0075	0.0758	0.0
2.5	37639	2.5	37639	0.0301	0.0157	0.0
2.5	37639	2.5	39036	0.0076	0.0025	0.0
2.5	39036	2.5	39036	0.2571	0.0124	0.0
2.5	20208	3.5	7	0.0108	0.0002	0.0001
2.5	20208	3.5	16953	0.0122	0.0294	0.0975

Appendix XVI (Continued)

J1	LEVEL 1	J2	LEVEL 2	(U2)2	(U4)2	(U6)2
2.5	20208	3.5	21777	0.0364	0.0397	0.4292
2.5	20208	3.5	28078	0.0018	0.1314	0.0121
2.5	20208	3.5	30173	0.0268	0.0213	0.0410
2.5	20208	3.5	35520	0.0019	0.0920	0.0659
2.5	20208	3.5	36547	0.0104	0.0063	0.0299
2.5	29729	3.5	7	0.0001	0.0109	0.0013
2.5	29729	3.5	16953	0.0011	0.0004	0.0946
2.5	29729	3.5	21777	0.1844	0.1680	0.0002
2.5	29729	3.5	28078	0.0215	0.0361	0.0987
2.5	29729	3.5	30173	0.0001	0.0220	0.1124
2.5	29729	3.5	35520	0.0097	0.0053	0.0018
2.5	29729	3.5	36547	0.1137	0.0450	0.0251
2.5	30644	3.5	7	0.0137	0.0015	0.0002
2.5	30644	3.5	16953	0.0482	0.0414	0.0465
2.5	30644	3.5	21777	0.0044	0.0013	0.1012
2.5	30644	3.5	28078	0.0392	0.0299	0.0012
2.5	30644	3.5	30173	0.0108	0.0018	0.0072
2.5	30644	3.5	35520	0.0040	0.0010	0.0199
2.5	30644	3.5	36547	0.0127	0.0239	0.0056
2.5	37639	3.5	7	0.0004	0.0024	0.0012
2.5	37639	3.5	16953	0.0198	0.0000	0.0185
2.5	37639	3.5	21777	0.1354	0.0650	0.0535
2.5	37639	3.5	28078	0.0066	0.0780	0.0046
2.5	37639	3.5	30173	0.1998	0.0016	0.0219
2.5	37639	3.5	35520	0.0708	0.0008	0.0530
2.5	37639	3.5	36547	0.0577	0.0026	0.0179
2.5	39036	3.5	7	0.0001	0.0105	0.0000
2.5	39036	3.5	16953	0.0069	0.0850	0.0028
2.5	39036	3.5	21777	0.0078	0.0199	0.1380
2.5	39036	3.5	28078	0.0038	0.0021	0.0396
2.5	39036	3.5	30173	0.0300	0.0031	0.0105
2.5	39036	3.5	35520	0.0479	0.0001	0.0052
2.5	39036	3.5	36547	0.1622	0.0073	0.0082
2.5	20208	4.5	22949	0.0806	0.0000	0.0685
2.5	20208	4.5	25933	0.1335	0.0225	0.0430
2.5	20208	4.5	32073	0.0192	0.0502	0.0063
2.5	20208	4.5	35794	0.0171	0.0004	0.0305
2.5	20208	4.5	39125	0.0006	0.0006	0.0024
2.5	29729	4.5	22949	0.0382	0.0917	0.2760
2.5	29729	4.5	25933	0.0421	0.0072	0.0371
2.5	29729	4.5	32073	0.0883	0.0022	0.0000
2.5	29729	4.5	35794	0.0777	0.0000	0.0142
2.5	29729	4.5	39125	0.0226	0.0086	0.0000
2.5	30644	4.5	22949	0.0013	0.0414	0.0157
2.5	30644	4.5	25933	0.0125	0.0456	0.0971
2.5	30644	4.5	32073	0.2480	0.0043	0.0399
2.5	30644	4.5	35794	0.0468	0.0110	0.0852
2.5	30644	4.5	39125	0.0091	0.0179	0.0009
2.5	37639	4.5	22949	0.0098	0.1277	0.1337

Appendix XVI (Continued)

J1	LEVEL 1	J2	LEVEL 2	(U2)2	(U4)2	(U6)2
2.5	37639	4.5	25933	0.0244	0.3553	0.0708
2.5	37639	4.5	32073	0.0419	0.0001	0.0299
2.5	37639	4.5	35794	0.1099	0.0047	0.0015
2.5	37639	4.5	39125	0.0005	0.0123	0.1787
2.5	39036	4.5	22949	0.0062	0.0238	0.0414
2.5	39036	4.5	25933	0.0066	0.1445	0.0241
2.5	39036	4.5	32073	0.0867	0.1046	0.0236
2.5	39036	4.5	35794	0.0017	0.0669	0.0023
2.5	39036	4.5	39125	0.2103	0.0015	0.0122
2.5	20208	5.5	25165	0.0	0.0031	0.0158
2.5	20208	5.5	31043	0.0	0.2039	0.0025
2.5	20208	5.5	35445	0.0	0.0001	0.0209
2.5	20208	5.5	39998	0.0	0.0059	0.0249
2.5	29729	5.5	25165	0.0	0.0567	0.0691
2.5	29729	5.5	31043	0.0	0.0003	0.0006
2.5	29729	5.5	35445	0.0	0.0066	0.0061
2.5	29729	5.5	39998	0.0	0.0007	0.0086
2.5	30644	5.5	25165	0.0	0.0569	0.1079
2.5	30644	5.5	31043	0.0	0.0842	0.0321
2.5	30644	5.5	35445	0.0	0.1103	0.0000
2.5	30644	5.5	39998	0.0	0.0007	0.0013
2.5	37639	5.5	25165	0.0	0.0770	0.2421
2.5	37639	5.5	31043	0.0	0.0202	0.0615
2.5	37639	5.5	35445	0.0	0.0095	0.0062
2.5	37639	5.5	39998	0.0	0.0062	0.0167
2.5	39036	5.5	25165	0.0	0.0063	0.0940
2.5	39036	5.5	31043	0.0	0.0202	0.0798
2.5	39036	5.5	35445	0.0	0.0407	0.0202
2.5	39036	5.5	39998	0.0	0.0001	0.0275
2.5	20208	6.5	26085	0.0	0.1032	0.0004
2.5	20208	6.5	34205	0.0	0.3280	0.0164
2.5	20208	6.5	35774	0.0	0.0848	0.0183
2.5	20208	6.5	39219	0.0	0.0015	0.1390
2.5	29729	6.5	26085	0.0	0.0384	0.0089
2.5	29729	6.5	34205	0.0	0.1047	0.0000
2.5	29729	6.5	35774	0.0	0.0003	0.0881
2.5	29729	6.5	39219	0.0	0.0150	0.1650
2.5	30644	6.5	26085	0.0	0.0120	0.0000
2.5	30644	6.5	34205	0.0	0.0705	0.0128
2.5	30644	6.5	35774	0.0	0.1919	0.0436
2.5	30644	6.5	39219	0.0	0.0836	0.0621
2.5	37639	6.5	26085	0.0	0.0051	0.0582
2.5	37639	6.5	34205	0.0	0.0099	0.0002
2.5	37639	6.5	35774	0.0	0.0035	0.0059
2.5	37639	6.5	39219	0.0	0.0206	0.0054
2.5	39036	6.5	26085	0.0	0.0620	0.0182
2.5	39036	6.5	34205	0.0	0.0551	0.1602
2.5	39036	6.5	35774	0.0	0.0065	0.0000
2.5	39036	6.5	39219	0.0	0.0033	0.0048

Appendix XVI (Continued)

J1	LEVEL 1	J2	LEVEL 2	(U2)2	(U4)2	(U6)2
2.5	20208	7.5	26483	0.0	0.0	0.0141
2.5	20208	7.5	38860	0.0	0.0	0.0479
2.5	29729	7.5	26483	0.0	0.0	0.2034
2.5	29729	7.5	38860	0.0	0.0	0.0319
2.5	30644	7.5	26483	0.0	0.0	0.0600
2.5	30644	7.5	38860	0.0	0.0	0.1925
2.5	37639	7.5	26483	0.0	0.0	0.0158
2.5	37639	7.5	38860	0.0	0.0	0.0058
2.5	39036	7.5	26483	0.0	0.0	0.3636
2.5	39036	7.5	38860	0.0	0.0	0.0494
2.5	20208	8.5	25038	0.0	0.0	0.6679
2.5	20208	8.5	35348	0.0	0.0	0.0673
2.5	29729	8.5	25038	0.0	0.0	0.0497
2.5	29729	8.5	35348	0.0	0.0	0.0359
2.5	30644	8.5	25038	0.0	0.0	0.3046
2.5	30644	8.5	35348	0.0	0.0	0.0051
2.5	37639	8.5	25038	0.0	0.0	0.0448
2.5	37639	8.5	35348	0.0	0.0	0.0405
2.5	39036	8.5	25038	0.0	0.0	0.0625
2.5	39036	8.5	35348	0.0	0.0	0.0076
3.5	7	3.5	7	0.0022	0.0001	0.0000
3.5	7	3.5	16953	0.0274	0.0084	0.0055
3.5	7	3.5	21777	0.0057	0.0005	0.0335
3.5	7	3.5	28078	0.0191	0.0088	0.0001
3.5	7	3.5	30173	0.0038	0.0148	0.0064
3.5	7	3.5	35520	0.0028	0.0185	0.0000
3.5	7	3.5	36547	0.0006	0.0013	0.0007
3.5	16953	3.5	16953	0.4619	0.2631	0.1694
3.5	16953	3.5	21777	0.0005	0.0495	0.2093
3.5	16953	3.5	28078	0.1859	0.0314	0.0119
3.5	16953	3.5	30173	0.0462	0.1134	0.0009
3.5	16953	3.5	35520	0.0042	0.0076	0.0134
3.5	16953	3.5	36547	0.0024	0.0738	0.0729
3.5	21777	3.5	21777	0.1034	0.0260	0.0323
3.5	21777	3.5	28078	0.0001	0.0138	0.0009
3.5	21777	3.5	30173	0.0875	0.0181	0.1111
3.5	21777	3.5	35520	0.0025	0.0034	0.0361
3.5	21777	3.5	36547	0.0752	0.0333	0.1058
3.5	28078	3.5	28078	0.1160	0.0215	0.0105
3.5	28078	3.5	30173	0.0316	0.0511	0.0265
3.5	28078	3.5	35520	0.2209	0.0016	0.0021
3.5	28078	3.5	36547	0.0544	0.0129	0.0146
3.5	30173	3.5	30173	0.1178	0.0174	0.0916
3.5	30173	3.5	35520	0.0020	0.1200	0.0550
3.5	30173	3.5	36547	0.0003	0.0000	0.0179
3.5	35520	3.5	35520	0.1326	0.1615	0.1833
3.5	35520	3.5	36547	0.0205	0.0000	0.1590
3.5	36547	3.5	36547	0.0671	0.0151	0.0000
3.5	7	4.5	22949	0.0115	0.0175	0.0613

Appendix XVI (Continued)

J1	LEVEL 1	J2	LEVEL 2	(U2)2	(U4)2	(U6)2
3.5	7	4.5	25933	0.0233	0.0126	0.0298
3.5	7	4.5	32073	0.0085	0.0475	0.0009
3.5	7	4.5	35794	0.0003	0.0048	0.0034
3.5	7	4.5	39125	0.0000	0.0173	0.0008
3.5	16953	4.5	22949	0.0755	0.1456	0.1887
3.5	16953	4.5	25933	0.0108	0.0577	0.0570
3.5	16953	4.5	32073	0.0013	0.1060	0.0575
3.5	16953	4.5	35794	0.0121	0.0000	0.0397
3.5	16953	4.5	39125	0.0000	0.0448	0.0722
3.5	21777	4.5	22949	0.0066	0.1246	0.1138
3.5	21777	4.5	25933	0.0543	0.0518	0.0027
3.5	21777	4.5	32073	0.0118	0.1316	0.0681
3.5	21777	4.5	35794	0.0094	0.0542	0.0379
3.5	21777	4.5	39125	0.0071	0.1220	0.1676
3.5	28078	4.5	22949	0.0015	0.1314	0.0267
3.5	28078	4.5	25933	0.0483	0.0209	0.0237
3.5	28078	4.5	32073	0.1781	0.0078	0.0002
3.5	28078	4.5	35794	0.0066	0.0367	0.0000
3.5	28078	4.5	39125	0.0018	0.1397	0.0346
3.5	30173	4.5	22949	0.0244	0.0003	0.0401
3.5	30173	4.5	25933	0.1289	0.0062	0.0827
3.5	30173	4.5	32073	0.0020	0.0014	0.0026
3.5	30173	4.5	35794	0.0905	0.0001	0.1250
3.5	30173	4.5	39125	0.0299	0.0000	0.0000
3.5	35520	4.5	22949	0.0189	0.0044	0.0357
3.5	35520	4.5	25933	0.0274	0.0077	0.0051
3.5	35520	4.5	32073	0.0012	0.0003	0.0136
3.5	35520	4.5	35794	0.0248	0.0235	0.0110
3.5	35520	4.5	39125	0.0265	0.0383	0.0972
3.5	36547	4.5	22949	0.1080	0.1899	0.0061
3.5	36547	4.5	25933	0.0378	0.0219	0.2101
3.5	36547	4.5	32073	0.2306	0.1128	0.0168
3.5	36547	4.5	35794	0.0049	0.0032	0.0226
3.5	36547	4.5	39125	0.0989	0.1983	0.0083
3.5	7	5.5	25165	0.0002	0.0074	0.1355
3.5	7	5.5	31043	0.0023	0.0929	0.0085
3.5	7	5.5	35445	0.0004	0.0201	0.0002
3.5	7	5.5	39998	0.0003	0.0000	0.0008
3.5	16953	5.5	25165	0.0294	0.0250	0.2741
3.5	16953	5.5	31043	0.0847	0.4191	0.0000
3.5	16953	5.5	35445	0.0054	0.0986	0.1656
3.5	16953	5.5	39998	0.0000	0.0023	0.0331
3.5	21777	5.5	25165	0.0009	0.0543	0.0356
3.5	21777	5.5	31043	0.0304	0.0328	0.0166
3.5	21777	5.5	35445	0.0040	0.0006	0.0536
3.5	21777	5.5	39998	0.0053	0.0126	0.0680
3.5	28078	5.5	25165	0.0557	0.0252	0.2353
3.5	28078	5.5	31043	0.2306	0.0001	0.0471
3.5	28078	5.5	35445	0.0003	0.0205	0.0024

Appendix XVI (Continued)

J1	LEVEL 1	J2	LEVEL 2	(U2)2	(U4)2	(U6)2
3.5	28078	5.5	39998	0.0033	0.0003	0.0116
3.5	30173	5.5	25165	0.0393	0.1390	0.0259
3.5	30173	5.5	31043	0.0058	0.0769	0.0067
3.5	30173	5.5	35445	0.0189	0.0227	0.2815
3.5	30173	5.5	39998	0.1239	0.0010	0.0000
3.5	35520	5.5	25165	0.0328	0.0103	0.0138
3.5	35520	5.5	31043	0.0001	0.0179	0.0002
3.5	35520	5.5	35445	0.1072	0.0162	0.0135
3.5	35520	5.5	39998	0.0985	0.0022	0.1990
3.5	36547	5.5	25165	0.0556	0.3985	0.0013
3.5	36547	5.5	31043	0.1530	0.0259	0.0922
3.5	36547	5.5	35445	0.1988	0.0120	0.0548
3.5	36547	5.5	39998	0.0005	0.0079	0.0004
3.5	7	6.5	26085	0.0	0.0063	0.1832
3.5	7	6.5	34205	0.0	0.0796	0.0054
3.5	7	6.5	35774	0.0	0.0005	0.0001
3.5	7	6.5	39219	0.0	0.0032	0.0001
3.5	16953	6.5	26085	0.0	0.0773	0.3201
3.5	16953	6.5	34205	0.0	0.0995	0.0339
3.5	16953	6.5	35774	0.0	0.0328	0.2406
3.5	16953	6.5	39219	0.0	0.0106	0.0340
3.5	21777	6.5	26085	0.0	0.0031	0.0334
3.5	21777	6.5	34205	0.0	0.0420	0.0000
3.5	21777	6.5	35774	0.0	0.0315	0.1389
3.5	21777	6.5	39219	0.0	0.0458	0.0281
3.5	28078	6.5	26085	0.0	0.0001	0.4283
3.5	28078	6.5	34205	0.0	0.2646	0.1686
3.5	28078	6.5	35774	0.0	0.0546	0.0057
3.5	28078	6.5	39219	0.0	0.0111	0.0040
3.5	30173	6.5	26085	0.0	0.0449	0.0032
3.5	30173	6.5	34205	0.0	0.0130	0.0085
3.5	30173	6.5	35774	0.0	0.0402	0.4134
3.5	30173	6.5	39219	0.0	0.0213	0.0001
3.5	35520	6.5	26085	0.0	0.0089	0.0035
3.5	35520	6.5	34205	0.0	0.0008	0.0497
3.5	35520	6.5	35774	0.0	0.0419	0.0116
3.5	35520	6.5	39219	0.0	0.0416	0.1945
3.5	36547	6.5	26085	0.0	0.0803	0.1585
3.5	36547	6.5	34205	0.0	0.0526	0.0603
3.5	36547	6.5	35774	0.0	0.0068	0.0312
3.5	36547	6.5	39219	0.0	0.0002	0.0013
3.5	7	7.5	26483	0.0	0.0011	0.2106
3.5	7	7.5	38860	0.0	0.0044	0.0010
3.5	16953	7.5	26483	0.0	0.0748	0.2668
3.5	16953	7.5	38860	0.0	0.1503	0.2591
3.5	21777	7.5	26483	0.0	0.0032	0.1203
3.5	21777	7.5	38860	0.0	0.0159	0.0019
3.5	28078	7.5	26483	0.0	0.1880	0.3832
3.5	28078	7.5	38860	0.0	0.1707	0.2787

Appendix XVI (Continued)

J1	LEVEL 1	J2	LEVEL 2	(U2)2	(U4)2	(U6)2
3.5	30173	7.5	26483	0.0	0.0033	0.0574
3.5	30173	7.5	38860	0.0	0.0067	0.0903
3.5	35520	7.5	26483	0.0	0.0016	0.0358
3.5	35520	7.5	38860	0.0	0.1242	0.0231
3.5	36547	7.5	26483	0.0	0.0501	0.0228
3.5	36547	7.5	38860	0.0	0.0736	0.0121
3.5	7	8.5	25038	0.0	0.0	0.1996
3.5	7	8.5	35348	0.0	0.0	0.0023
3.5	16953	8.5	25038	0.0	0.0	0.7914
3.5	16953	8.5	35348	0.0	0.0	0.3465
3.5	21777	8.5	25038	0.0	0.0	0.0580
3.5	21777	8.5	35348	0.0	0.0	0.3598
3.5	28078	8.5	25038	0.0	0.0	0.0423
3.5	28078	8.5	35348	0.0	0.0	0.0059
3.5	30173	8.5	25038	0.0	0.0	0.0148
3.5	30173	8.5	35348	0.0	0.0	0.3621
3.5	35520	8.5	25038	0.0	0.0	0.0536
3.5	35520	8.5	35348	0.0	0.0	0.4505
3.5	36547	8.5	25038	0.0	0.0	0.2269
3.5	36547	8.5	35348	0.0	0.0	0.0550
4.5	22949	4.5	22949	0.4009	0.1655	0.0217
4.5	22949	4.5	25933	0.1133	0.0444	0.0025
4.5	22949	4.5	32073	0.2879	0.0093	0.0786
4.5	22949	4.5	35794	0.0424	0.1995	0.0929
4.5	22949	4.5	39125	0.1041	0.2402	0.0101
4.5	25933	4.5	25933	0.2484	0.2750	0.1498
4.5	25933	4.5	32073	0.0536	0.0637	0.0731
4.5	25933	4.5	35794	0.0559	0.0551	0.0101
4.5	25933	4.5	39125	0.0518	0.0107	0.0205
4.5	32073	4.5	32073	0.1452	0.0000	0.0112
4.5	32073	4.5	35794	0.0186	0.0968	0.0721
4.5	32073	4.5	39125	0.0069	0.0238	0.0976
4.5	35794	4.5	35794	0.0056	0.0380	0.0140
4.5	35794	4.5	39125	0.0266	0.0046	0.0320
4.5	39125	4.5	39125	0.7616	0.0322	0.0060
4.5	22949	5.5	25165	0.0890	0.0002	0.0077
4.5	22949	5.5	31043	0.0289	0.0408	0.1259
4.5	22949	5.5	35445	0.0096	0.0075	0.0935
4.5	22949	5.5	39998	0.0266	0.0417	0.0000
4.5	25933	5.5	25165	0.0648	0.1231	0.0321
4.5	25933	5.5	31043	0.4004	0.0103	0.0261
4.5	25933	5.5	35445	0.0004	0.0565	0.0004
4.5	25933	5.5	39998	0.0001	0.2612	0.0084
4.5	32073	5.5	25165	0.0587	0.0466	0.0657
4.5	32073	5.5	31043	0.0041	0.0247	0.0000
4.5	32073	5.5	35445	0.4138	0.1876	0.0491
4.5	32073	5.5	39998	0.3222	0.1082	0.1862
4.5	35794	5.5	25165	0.0845	0.0309	0.0375
4.5	35794	5.5	31043	0.2543	0.0159	0.1866

Appendix XVI (Continued)

J1	LEVEL 1	J2	LEVEL 2	(U2)2	(U4)2	(U6)2
4.5	35794	5.5	35445	0.0230	0.0181	0.1629
4.5	35794	5.5	39998	0.0218	0.0107	0.0764
4.5	39125	5.5	25165	0.1535	0.0015	0.0005
4.5	39125	5.5	31043	0.0585	0.0205	0.0760
4.5	39125	5.5	35445	0.1105	0.0006	0.0268
4.5	39125	5.5	39998	0.0550	0.0454	0.0648
4.5	22949	6.5	26085	0.0294	0.0004	0.0000
4.5	22949	6.5	34205	0.0186	0.1306	0.0607
4.5	22949	6.5	35774	0.0118	0.1666	0.0004
4.5	22949	6.5	39219	0.0034	0.0827	0.1412
4.5	25933	6.5	26085	0.0144	0.0988	0.0037
4.5	25933	6.5	34205	0.1048	0.0677	0.1701
4.5	25933	6.5	35774	0.0036	0.0482	0.0166
4.5	25933	6.5	39219	0.0061	0.0044	0.0407
4.5	32073	6.5	26085	0.1284	0.0003	0.0002
4.5	32073	6.5	34205	0.1583	0.0013	0.0507
4.5	32073	6.5	35774	0.0414	0.2865	0.1071
4.5	32073	6.5	39219	0.0499	0.0587	0.0060
4.5	35794	6.5	26085	0.0221	0.5109	0.0036
4.5	35794	6.5	34205	0.0897	0.0084	0.0004
4.5	35794	6.5	35774	0.0199	0.0306	0.0136
4.5	35794	6.5	39219	0.0086	0.0658	0.1149
4.5	39125	6.5	26085	0.1124	0.1004	0.0467
4.5	39125	6.5	34205	0.0134	0.0446	0.2201
4.5	39125	6.5	35774	0.2516	0.0050	0.0300
4.5	39125	6.5	39219	0.0034	0.0131	0.0061
4.5	22949	7.5	26483	0.0	0.1340	0.0065
4.5	22949	7.5	38860	0.0	0.0715	0.1953
4.5	25933	7.5	26483	0.0	0.1128	0.0424
4.5	25933	7.5	38860	0.0	0.1879	0.0589
4.5	32073	7.5	26483	0.0	0.0363	0.0064
4.5	32073	7.5	38860	0.0	0.2482	0.0389
4.5	35794	7.5	26483	0.0	0.0042	0.0498
4.5	35794	7.5	38860	0.0	0.0055	0.0893
4.5	39125	7.5	26483	0.0	0.1593	0.0777
4.5	39125	7.5	38860	0.0	0.0016	0.1604
4.5	22949	8.5	25038	0.0	0.0318	0.0709
4.5	22949	8.5	35348	0.0	0.0025	0.0523
4.5	25933	8.5	25038	0.0	0.0631	0.1120
4.5	25933	8.5	35348	0.0	0.0014	0.0372
4.5	32073	8.5	25038	0.0	0.1058	0.1352
4.5	32073	8.5	35348	0.0	0.0285	0.0222
4.5	35794	8.5	25038	0.0	0.0393	0.0581
4.5	35794	8.5	35348	0.0	0.0023	0.0033
4.5	39125	8.5	25038	0.0	0.0750	0.0543
4.5	39125	8.5	35348	0.0	0.1657	0.0038
5.5	25165	5.5	25165	0.1482	0.1759	0.0445
5.5	25165	5.5	31043	0.2473	0.0243	0.1394
5.5	25165	5.5	35445	0.0865	0.0013	0.0379

Appendix XVI (Continued)

J1	LEVEL 1	J2	LEVEL 2	(U2)2	(U4)2	(U6)2
5.5	25165	5.5	39998	0.1660	0.2047	0.1641
5.5	31043	5.5	31043	0.6750	0.4281	0.0200
5.5	31043	5.5	35445	0.0040	0.0123	0.0005
5.5	31043	5.5	39998	0.0000	0.0015	0.0450
5.5	35445	5.5	35445	0.0133	0.3611	0.0966
5.5	35445	5.5	39998	0.0071	0.0065	0.0274
5.5	39998	5.5	39998	0.0027	0.0171	0.0364
5.5	25165	6.5	26085	0.0840	0.0040	0.0028
5.5	25165	6.5	34205	0.0039	0.1534	0.0065
5.5	25165	6.5	35774	0.0175	0.0960	0.0349
5.5	25165	6.5	39219	0.0015	0.1222	0.0215
5.5	31043	6.5	26085	0.3374	0.0561	0.1982
5.5	31043	6.5	34205	0.7768	0.1113	0.1551
5.5	31043	6.5	35774	0.2439	0.0193	0.1083
5.5	31043	6.5	39219	0.0172	0.0156	0.0219
5.5	35445	6.5	26085	0.0004	0.0053	0.1768
5.5	35445	6.5	34205	0.2484	0.1201	0.0146
5.5	35445	6.5	35774	0.4806	0.0003	0.0784
5.5	35445	6.5	39219	0.0922	0.0500	0.0178
5.5	39998	6.5	26085	0.2239	0.0046	0.0910
5.5	39998	6.5	34205	0.5084	0.0160	0.1884
5.5	39998	6.5	35774	0.0067	0.0266	0.0000
5.5	39998	6.5	39219	0.1308	0.0648	0.0698
5.5	25165	7.5	26483	0.0115	0.0033	0.0222
5.5	25165	7.5	38860	0.0009	0.0604	0.0581
5.5	31043	7.5	26483	0.0955	0.0022	0.1778
5.5	31043	7.5	38860	0.1642	0.0290	0.0378
5.5	35445	7.5	26483	0.0909	0.3236	0.1109
5.5	35445	7.5	38860	0.1240	0.0077	0.1644
5.5	39998	7.5	26483	0.1455	0.6462	0.1986
5.5	39998	7.5	38860	0.0115	0.0630	0.0017
5.5	25165	8.5	25038	0.0	0.0914	0.0223
5.5	25165	8.5	35348	0.0	0.0357	0.0424
5.5	31043	8.5	25038	0.0	0.4480	0.1856
5.5	31043	8.5	35348	0.0	0.0205	0.0373
5.5	35445	8.5	25038	0.0	0.2653	0.0237
5.5	35445	8.5	35348	0.0	0.1871	0.0706
5.5	39998	8.5	25038	0.0	0.0000	0.0600
5.5	39998	8.5	35348	0.0	0.2339	0.3123
6.5	26085	6.5	26085	0.0758	0.1051	0.0011
6.5	26085	6.5	34205	0.1610	0.0761	0.0082
6.5	26085	6.5	35774	0.3576	0.4116	0.0002
6.5	26085	6.5	39219	0.0746	0.0645	0.0025
6.5	34205	6.5	34205	0.1409	0.0225	0.2706
6.5	34205	6.5	35774	0.0552	0.0005	0.1474
6.5	34205	6.5	39219	0.0126	0.0062	0.0411
6.5	35774	6.5	35774	0.2224	0.0732	0.0624
6.5	35774	6.5	39219	0.0236	0.0249	0.0533
6.5	39219	6.5	39219	0.0487	0.0041	0.0801

Appendix XVI (Continued)

J1	LEVEL 1	J2	LEVEL 2	(U2)2	(U4)2	(U6)2
6.5	26085	7.5	26483	0.0888	0.0021	0.0106
6.5	26085	7.5	38860	0.0054	0.3241	0.0994
6.5	34205	7.5	26483	0.6162	0.0525	0.0196
6.5	34205	7.5	38860	1.1834	0.0000	0.1319
6.5	35774	7.5	26483	0.3863	0.1668	0.0144
6.5	35774	7.5	38860	0.0313	0.0634	0.0041
6.5	39219	7.5	26483	0.1072	0.0088	0.0136
6.5	39219	7.5	38860	0.0256	0.0953	0.1705
6.5	26085	8.5	25038	0.0014	0.0167	0.0069
6.5	26085	8.5	35348	0.0186	0.0404	0.0082
6.5	34205	8.5	25038	0.0382	0.1354	0.0434
6.5	34205	8.5	35348	0.0001	0.0015	0.0032
6.5	35774	8.5	25038	0.2382	0.5128	0.0216
6.5	35774	8.5	35348	0.1031	0.1130	0.0571
6.5	39219	8.5	25038	0.0557	0.0974	0.0536
6.5	39219	8.5	35348	0.0049	0.0303	0.1485
7.5	26483	7.5	26483	0.0810	0.1617	0.0204
7.5	26483	7.5	38860	0.2547	0.4631	0.0405
7.5	38860	7.5	38860	0.0019	0.1057	0.0482
7.5	26483	8.5	25038	0.1578	0.0663	0.0008
7.5	26483	8.5	35348	0.0089	0.0282	0.0634
7.5	38860	8.5	25038	1.9563	1.0250	0.9012
7.5	38860	8.5	35348	0.1149	0.0998	0.3518
8.5	25038	8.5	25038	0.0027	0.0151	0.0097
8.5	25038	8.5	35348	0.0076	0.0433	0.0518
8.5	35348	8.5	35348	0.0419	0.2478	0.2412

Appendix XVII
Matrix Elements of (Uλ)2 for $BkCl_3$ with Ground State, J1 = 6.0

J2	LEVEL	(U2)2	(U4)2	(U6)2
4.0	4566	0.1373	0.5062	0.1427
5.0	5156	0.4901	0.5575	0.0637
3.0	7734	0.0	0.2377	0.3503
2.0	7968	0.0	0.0643	0.4295
1.0	9648	0.0	0.0	0.3694
0.0	9894	0.0	0.0	0.1514
6.0	15708	0.0000	0.0763	0.1065
4.0	15754	0.0002	0.0307	0.0805
4.0	19674	0.0000	0.0040	0.0539
2.0	20484	0.0	0.0003	0.0232
5.0	21020	0.0121	0.0135	0.0684
7.0	21036	0.0429	0.0168	0.1847
10.0	21232	0.0	0.0006	0.3880
3.0	22452	0.0	0.0054	0.0197
8.0	23129	0.0001	0.0025	0.3025
9.0	23714	0.0	0.0749	0.3765
6.0	23863	0.0021	0.0135	0.0062
2.0	24086	0.0	0.0000	0.0048
5.0	24881	0.0031	0.0446	0.0779
6.0	26071	0.0164	0.0005	0.0540
0.0	26198	0.0	0.0	0.0000
3.0	26289	0.0	0.0058	0.0027
4.0	26529	0.0155	0.0041	0.0031
7.0	26858	0.0103	0.0444	0.0120
5.0	27525	0.0004	0.0008	0.0016

Appendix XVII (Continued)
Matrix Elements of (Uλ)2 for $BkCl_3$ (to 28000 cm^{-1})

J1	LEVEL 1	J2	LEVEL 2	(U2)2	(U4)2	(U6)2
0.0	9894	2.0	7968	0.1284	0.0	0.0
0.0	9894	2.0	20484	0.0056	0.0	0.0
0.0	9894	2.0	24086	0.0053	0.0	0.0
0.0	26198	2.0	7968	0.0000	0.0	0.0
0.0	26198	2.0	20484	0.0834	0.0	0.0
0.0	26198	2.0	24086	0.0104	0.0	0.0
0.0	9894	4.0	4566	0.0	0.1064	0.0
0.0	9894	4.0	15754	0.0	0.0187	0.0
0.0	9894	4.0	19674	0.0	0.0097	0.0
0.0	9894	4.0	26529	0.0	0.0000	0.0
0.0	26198	4.0	4566	0.0	0.0000	0.0
0.0	26198	4.0	15754	0.0	0.0545	0.0
0.0	26198	4.0	19674	0.0	0.0295	0.0
0.0	26198	4.0	26529	0.0	0.0009	0.0
0.0	9894	6.0	182	0.0	0.0	0.1514
0.0	9894	6.0	15708	0.0	0.0	0.0038
0.0	9894	6.0	23863	0.0	0.0	0.0223
0.0	9894	6.0	26071	0.0	0.0	0.0001
0.0	26198	6.0	182	0.0	0.0	0.0000
0.0	26198	6.0	15708	0.0	0.0	0.1867
0.0	26198	6.0	23863	0.0	0.0	0.0302
0.0	26198	6.0	26071	0.0	0.0	0.0242
1.0	9648	1.0	9648	0.1487	0.0	0.0
1.0	9648	2.0	7968	0.0338	0.0	0.0
1.0	9648	2.0	20484	0.0098	0.0	0.0
1.0	9648	2.0	24086	0.0004	0.0	0.0
1.0	9648	3.0	7734	0.2142	0.1131	0.0
1.0	9648	3.0	22452	0.0052	0.0002	0.0
1.0	9648	3.0	26289	0.0016	0.0038	0.0
1.0	9648	4.0	4566	0.0	0.1112	0.0
1.0	9648	4.0	15754	0.0	0.0432	0.0
1.0	9648	4.0	19674	0.0	0.0000	0.0
1.0	9648	4.0	26529	0.0	0.0000	0.0
1.0	9648	5.0	5156	0.0	0.1179	0.0507
1.0	9648	5.0	21020	0.0	0.0069	0.0001
1.0	9648	5.0	24881	0.0	0.0000	0.0001
1.0	9648	5.0	27525	0.0	0.0006	0.0000
1.0	9648	6.0	182	0.0	0.0	0.3694
1.0	9648	6.0	15708	0.0	0.0	0.0100
1.0	9648	6.0	23863	0.0	0.0	0.0204
1.0	9648	6.0	26071	0.0	0.0	0.0094
1.0	9648	7.0	21036	0.0	0.0	0.0041
1.0	9648	7.0	26858	0.0	0.0	0.0276
2.0	7968	2.0	7968	0.1046	0.1037	0.0
2.0	7968	2.0	20484	0.0004	0.0009	0.0
2.0	7968	2.0	24086	0.0007	0.0029	0.0

Appendix XVII (Continued)

J1	LEVEL 1	J2	LEVEL 2	(U2)2	(U4)2	(U6)2
2.0	20484	2.0	20484	0.1399	0.0906	0.0
2.0	20484	2.0	24086	0.0022	0.0111	0.0
2.0	24086	2.0	24086	0.0007	0.0022	0.0
2.0	7968	3.0	7734	0.1256	0.1633	0.0
2.0	7968	3.0	22452	0.0179	0.0000	0.0
2.0	7968	3.0	26289	0.0016	0.0012	0.0
2.0	20484	3.0	7734	0.0293	0.0198	0.0
2.0	20484	3.0	22452	0.0013	0.0314	0.0
2.0	20484	3.0	26289	0.0013	0.0285	0.0
2.0	24086	3.0	7734	0.0003	0.0002	0.0
2.0	24086	3.0	22452	0.0067	0.0034	0.0
2.0	24086	3.0	26289	0.0050	0.0650	0.0
2.0	7968	4.0	4566	0.2446	0.0014	0.0308
2.0	7968	4.0	15754	0.0012	0.0028	0.0007
2.0	7968	4.0	19674	0.0377	0.0009	0.0080
2.0	7968	4.0	26529	0.0049	0.0033	0.0008
2.0	20484	4.0	4566	0.0159	0.0005	0.0008
2.0	20484	4.0	15754	0.2964	0.0002	0.0314
2.0	20484	4.0	19674	0.0642	0.0091	0.0252
2.0	20484	4.0	26529	0.0309	0.0119	0.0015
2.0	24086	4.0	4566	0.0034	0.0081	0.1487
2.0	24086	4.0	15754	0.0017	0.0277	0.1697
2.0	24086	4.0	19674	0.0350	0.0183	0.0556
2.0	24086	4.0	26529	0.0236	0.1160	0.0093
2.0	7968	5.0	5156	0.0	0.2489	0.1791
2.0	7968	5.0	21020	0.0	0.0031	0.0179
2.0	7968	5.0	24881	0.0	0.0160	0.0269
2.0	7968	5.0	27525	0.0	0.0087	0.0444
2.0	20484	5.0	5156	0.0	0.0581	0.0207
2.0	20484	5.0	21020	0.0	0.0110	0.1389
2.0	20484	5.0	24881	0.0	0.0237	0.0369
2.0	20484	5.0	27525	0.0	0.0614	0.1584
2.0	24086	5.0	5156	0.0	0.0002	0.0004
2.0	24086	5.0	21020	0.0	0.0095	0.0085
2.0	24086	5.0	24881	0.0	0.0338	0.0077
2.0	24086	5.0	27525	0.0	0.0333	0.0001
2.0	7968	6.0	182	0.0	0.0643	0.4295
2.0	7968	6.0	15708	0.0	0.0237	0.0131
2.0	7968	6.0	23863	0.0	0.0000	0.0068
2.0	7968	6.0	26071	0.0	0.0222	0.0091
2.0	20484	6.0	182	0.0	0.0003	0.0232
2.0	20484	6.0	15708	0.0	0.1438	0.3649
2.0	20484	6.0	23863	0.0	0.0006	0.0000
2.0	20484	6.0	26071	0.0	0.0150	0.0496
2.0	24086	6.0	182	0.0	0.0000	0.0048
2.0	24086	6.0	15708	0.0	0.0070	0.0460
2.0	24086	6.0	23863	0.0	0.1284	0.1231
2.0	24086	6.0	26071	0.0	0.0116	0.0001
2.0	7968	7.0	21036	0.0	0.0	0.0829

Appendix XVII (Continued)

J1	LEVEL 1	J2	LEVEL 2	(U2)2	(U4)2	(U6)2
2.0	7968	7.0	26858	0.0	0.0	0.0669
2.0	20484	7.0	21036	0.0	0.0	0.1751
2.0	20484	7.0	26858	0.0	0.0	0.0819
2.0	24086	7.0	21036	0.0	0.0	0.0035
2.0	24086	7.0	26858	0.0	0.0	0.0784
2.0	7968	8.0	23129	0.0	0.0	0.1209
2.0	20484	8.0	23129	0.0	0.0	0.1724
2.0	24086	8.0	23129	0.0	0.0	0.0202
3.0	7734	3.0	7734	0.0296	0.0176	0.0267
3.0	7734	3.0	22452	0.0002	0.0003	0.0000
3.0	7734	3.0	26289	0.0011	0.0003	0.0006
3.0	22452	3.0	22452	0.0008	0.0006	0.0022
3.0	22452	3.0	26289	0.0082	0.0158	0.0109
3.0	26289	3.0	26289	0.1504	0.0928	0.0794
3.0	7734	4.0	4566	0.2422	0.1128	0.1326
3.0	7734	4.0	15754	0.0780	0.0212	0.0214
3.0	7734	4.0	19674	0.0044	0.0016	0.0000
3.0	7734	4.0	26529	0.0025	0.0001	0.0017
3.0	22452	4.0	4566	0.0232	0.0001	0.1602
3.0	22452	4.0	15754	0.0009	0.0080	0.3133
3.0	22452	4.0	19674	0.0063	0.1246	0.0333
3.0	22452	4.0	26529	0.0205	0.1809	0.0318
3.0	26289	4.0	4566	0.0124	0.0642	0.0333
3.0	26289	4.0	15754	0.0321	0.1647	0.0016
3.0	26289	4.0	19674	0.0088	0.0003	0.0068
3.0	26289	4.0	26529	0.1528	0.0139	0.0208
3.0	7734	5.0	5156	0.1968	0.2168	0.3321
3.0	7734	5.0	21020	0.0163	0.0000	0.0026
3.0	7734	5.0	24881	0.0028	0.0021	0.0066
3.0	7734	5.0	27525	0.0014	0.0016	0.0007
3.0	22452	5.0	5156	0.0020	0.0000	0.0072
3.0	22452	5.0	21020	0.0743	0.1882	0.0232
3.0	22452	5.0	24881	0.0782	0.0546	0.0017
3.0	22452	5.0	27525	0.0140	0.0338	0.0336
3.0	26289	5.0	5156	0.0020	0.0002	0.0165
3.0	26289	5.0	21020	0.1850	0.0313	0.0675
3.0	26289	5.0	24881	0.1022	0.0598	0.0092
3.0	26289	5.0	27525	0.0025	0.1288	0.0000
3.0	7734	6.0	182	0.0	0.2377	0.3503
3.0	7734	6.0	15708	0.0	0.0146	0.0008
3.0	7734	6.0	23863	0.0	0.0075	0.0031
3.0	7734	6.0	26071	0.0	0.0290	0.0145
3.0	22452	6.0	182	0.0	0.0054	0.0197
3.0	22452	6.0	15708	0.0	0.0415	0.1368
3.0	22452	6.0	23863	0.0	0.1703	0.1694
3.0	22452	6.0	26071	0.0	0.1953	0.1208
3.0	26289	6.0	182	0.0	0.0058	0.0027
3.0	26289	6.0	15708	0.0	0.0000	0.0779
3.0	26289	6.0	23863	0.0	0.0001	0.0551

Appendix XVII (Continued)

J1	LEVEL 1	J2	LEVEL 2	(U2)2	(U4)2	(U6)2
3.0	26289	6.0	26071	0.0	0.0326	0.0097
3.0	7734	7.0	21036	0.0	0.0121	0.0000
3.0	7734	7.0	26858	0.0	0.0001	0.0102
3.0	22452	7.0	21036	0.0	0.0073	0.0182
3.0	22452	7.0	26858	0.0	0.0289	0.0112
3.0	26289	7.0	21036	0.0	0.0367	0.0364
3.0	26289	7.0	26858	0.0	0.0003	0.0016
3.0	7734	8.0	23129	0.0	0.0	0.0210
3.0	22452	8.0	23129	0.0	0.0	0.0618
3.0	26289	8.0	23129	0.0	0.0	0.0000
3.0	7734	9.0	23714	0.0	0.0	0.0673
3.0	22452	9.0	23714	0.0	0.0	0.0012
3.0	26289	9.0	23714	0.0	0.0	0.1622
4.0	4566	4.0	4566	0.0081	0.2232	0.2762
4.0	4566	4.0	15754	0.0001	0.0020	0.0043
4.0	4566	4.0	19674	0.0051	0.0026	0.1029
4.0	4566	4.0	26529	0.0120	0.1278	0.0449
4.0	15754	4.0	15754	0.0031	0.2175	0.2233
4.0	15754	4.0	19674	0.0136	0.0011	0.1386
4.0	15754	4.0	26529	0.0007	0.1567	0.0131
4.0	19674	4.0	19674	0.0001	0.0403	0.1641
4.0	19674	4.0	26529	0.0293	0.0037	0.0891
4.0	26529	4.0	26529	0.9745	0.1213	0.0161
4.0	4566	5.0	5156	0.3231	0.0025	0.2958
4.0	4566	5.0	21020	0.0421	0.0067	0.1367
4.0	4566	5.0	24881	0.0006	0.0956	0.0009
4.0	4566	5.0	27525	0.0124	0.0177	0.0563
4.0	15754	5.0	5156	0.2071	0.0055	0.0844
4.0	15754	5.0	21020	0.0001	0.0048	0.3989
4.0	15754	5.0	24881	0.0052	0.1268	0.0000
4.0	15754	5.0	27525	0.0876	0.0051	0.0000
4.0	19674	5.0	5156	0.0054	0.0038	0.0001
4.0	19674	5.0	21020	0.0001	0.3796	0.0211
4.0	19674	5.0	24881	0.1288	0.1112	0.1064
4.0	19674	5.0	27525	0.0741	0.0541	0.0011
4.0	26529	5.0	5156	0.0008	0.0063	0.0118
4.0	26529	5.0	21020	0.0035	0.0025	0.0013
4.0	26529	5.0	24881	0.0120	0.0437	0.1152
4.0	26529	5.0	27525	0.0051	0.0236	0.0300
4.0	4566	6.0	182	0.1373	0.5062	0.1427
4.0	4566	6.0	15708	0.0540	0.0765	0.0154
4.0	4566	6.0	23863	0.0096	0.0000	0.1297
4.0	4566	6.0	26071	0.0000	0.0015	0.1743
4.0	15754	6.0	182	0.0002	0.0307	0.0805
4.0	15754	6.0	15708	0.1929	0.5453	0.0038
4.0	15754	6.0	23863	0.0041	0.0136	0.2092
4.0	15754	6.0	26071	0.0040	0.0159	0.1117
4.0	19674	6.0	182	0.0000	0.0040	0.0539
4.0	19674	6.0	15708	0.0890	0.1939	0.4176

Appendix XVII (Continued)

J1	LEVEL 1	J2	LEVEL 2	(U2)2	(U4)2	(U6)2
4.0	19674	6.0	23863	0.1120	0.2157	0.2415
4.0	19674	6.0	26071	0.0076	0.0043	0.0144
4.0	26529	6.0	182	0.0155	0.0041	0.0031
4.0	26529	6.0	15708	0.1601	0.0037	0.0343
4.0	26529	6.0	23863	0.0626	0.0204	0.0398
4.0	26529	6.0	26071	0.0904	0.0716	0.0096
4.0	4566	7.0	21036	0.0	0.1434	0.0101
4.0	4566	7.0	26858	0.0	0.0262	0.1511
4.0	15754	7.0	21036	0.0	0.1684	0.0001
4.0	15754	7.0	26858	0.0	0.0494	0.0972
4.0	19674	7.0	21036	0.0	0.0009	0.2192
4.0	19674	7.0	26858	0.0	0.0948	0.0197
4.0	26529	7.0	21036	0.0	0.0049	0.3148
4.0	26529	7.0	26858	0.0	0.0010	0.0111
4.0	4566	8.0	23129	0.0	0.0963	0.0005
4.0	15754	8.0	23129	0.0	0.0768	0.0117
4.0	19674	8.0	23129	0.0	0.0381	0.1041
4.0	26529	8.0	23129	0.0	0.1792	0.3544
4.0	4566	9.0	23714	0.0	0.0	0.1694
4.0	15754	9.0	23714	0.0	0.0	0.1308
4.0	19674	9.0	23714	0.0	0.0	0.0064
4.0	26529	9.0	23714	0.0	0.0	0.3654
4.0	4566	10.0	21232	0.0	0.0	0.4386
4.0	15754	10.0	21232	0.0	0.0	0.4791
4.0	19674	10.0	21232	0.0	0.0	0.0512
4.0	26529	10.0	21232	0.0	0.0	0.0359
5.0	5156	5.0	5156	0.2471	0.2166	0.2258
5.0	5156	5.0	21020	0.0021	0.0003	0.0042
5.0	5156	5.0	24881	0.0234	0.0013	0.0323
5.0	5156	5.0	27525	0.0091	0.0002	0.0388
5.0	21020	5.0	21020	0.4746	0.0156	0.2234
5.0	21020	5.0	24881	0.3593	0.0069	0.0240
5.0	21020	5.0	27525	0.0265	0.0267	0.0181
5.0	24881	5.0	24881	0.1288	0.0478	0.2970
5.0	24881	5.0	27525	0.0084	0.0513	0.0453
5.0	27525	5.0	27525	0.0046	0.0169	0.0032
5.0	5156	6.0	182	0.4901	0.5575	0.0637
5.0	5156	6.0	15708	0.0399	0.0224	0.0079
5.0	5156	6.0	23863	0.0055	0.0005	0.0575
5.0	5156	6.0	26071	0.0053	0.0150	0.0252
5.0	21020	6.0	182	0.0121	0.0135	0.0684
5.0	21020	6.0	15708	0.0122	0.0708	0.0065
5.0	21020	6.0	23863	0.0843	0.0586	0.2823
5.0	21020	6.0	26071	0.1241	0.1167	0.2159
5.0	24881	6.0	182	0.0031	0.0446	0.0779
5.0	24881	6.0	15708	0.0375	0.1193	0.2429
5.0	24881	6.0	23863	0.0051	0.2404	0.0683
5.0	24881	6.0	26071	0.0759	0.0030	0.0050
5.0	27525	6.0	182	0.0004	0.0008	0.0016

Appendix XVII (Continued)

J1	LEVEL 1	J2	LEVEL 2	(U2)2	(U4)2	(U6)2
5.0	27525	6.0	15708	0.0877	0.0360	0.1239
5.0	27525	6.0	23863	0.0244	0.0027	0.0007
5.0	27525	6.0	26071	0.0036	0.0941	0.0025
5.0	5156	7.0	21036	0.0099	0.0083	0.0001
5.0	5156	7.0	26858	0.0036	0.0008	0.1126
5.0	21020	7.0	21036	0.0000	0.1918	0.0192
5.0	21020	7.0	26858	0.0629	0.0045	0.1558
5.0	24881	7.0	21036	0.6295	0.1447	0.0021
5.0	24881	7.0	26858	0.0437	0.1787	0.1290
5.0	27525	7.0	21036	0.0000	0.0804	0.0063
5.0	27525	7.0	26858	0.1564	0.0209	0.1224
5.0	5156	8.0	23129	0.0	0.0410	0.0118
5.0	21020	8.0	23129	0.0	0.1687	0.0001
5.0	24881	8.0	23129	0.0	0.0600	0.0208
5.0	27525	8.0	23129	0.0	0.1615	0.0897
5.0	5156	9.0	23714	0.0	0.0118	0.0268
5.0	21020	9.0	23714	0.0	0.1612	0.0033
5.0	24881	9.0	23714	0.0	0.3370	0.0951
5.0	27525	9.0	23714	0.0	0.2581	0.1321
5.0	5156	10.0	21232	0.0	0.0	0.0079
5.0	21020	10.0	21232	0.0	0.0	0.3181
5.0	24881	10.0	21232	0.0	0.0	0.4508
5.0	27525	10.0	21232	0.0	0.0	0.0401
6.0	182	6.0	182	1.1827	0.2438	0.0029
6.0	182	6.0	15708	0.0000	0.0763	0.1065
6.0	182	6.0	23863	0.0021	0.0135	0.0062
6.0	182	6.0	26071	0.0164	0.0005	0.0540
6.0	15708	6.0	15708	1.0235	0.1029	0.6104
6.0	15708	6.0	23863	0.0545	0.0602	0.0420
6.0	15708	6.0	26071	0.0070	0.0680	0.1058
6.0	23863	6.0	23863	0.2546	0.1959	0.0948
6.0	23863	6.0	26071	0.0539	0.0186	0.0317
6.0	26071	6.0	26071	0.0167	0.0158	0.0885
6.0	182	7.0	21036	0.0429	0.0168	0.1847
6.0	182	7.0	26858	0.0103	0.0444	0.0120
6.0	15708	7.0	21036	0.1656	0.0188	0.2611
6.0	15708	7.0	26858	0.0158	0.2034	0.0000
6.0	23863	7.0	21036	0.0483	0.2930	0.3997
6.0	23863	7.0	26858	0.0733	0.0123	0.0399
6.0	26071	7.0	21036	0.0649	0.0358	0.0313
6.0	26071	7.0	26858	0.0514	0.0026	0.2630
6.0	182	8.0	23129	0.0001	0.0025	0.3025
6.0	15708	8.0	23129	0.0106	0.0090	0.5856
6.0	23863	8.0	23129	0.0012	0.1249	0.0758
6.0	26071	8.0	23129	0.0000	0.1934	0.0335
6.0	182	9.0	23714	0.0	0.0749	0.3765
6.0	15708	9.0	23714	0.0	0.3386	0.4294
6.0	23863	9.0	23714	0.0	0.0320	0.1597
6.0	26071	9.0	23714	0.0	0.0049	0.3354

Appendix XVII (Continued)

J1	LEVEL 1	J2	LEVEL 2	(U2)2	(U4)2	(U6)2
6.0	182	10.0	21232	0.0	0.0006	0.3880
6.0	15708	10.0	21232	0.0	0.0398	0.7359
6.0	23863	10.0	21232	0.0	0.0436	0.0530
6.0	26071	10.0	21232	0.0	0.2430	0.2549
7.0	21036	7.0	21036	0.6271	0.0801	0.0513
7.0	21036	7.0	26858	0.0766	0.0418	0.1085
7.0	26858	7.0	26858	0.0363	0.0831	0.1136
7.0	21036	8.0	23129	0.4149	0.0066	0.0284
7.0	26858	8.0	23129	0.2359	0.5729	0.1054
7.0	21036	9.0	23714	0.0025	0.0213	0.0104
7.0	26858	9.0	23714	0.0024	0.0864	0.0129
7.0	21036	10.0	21232	0.0	0.5072	0.0005
7.0	26858	10.0	21232	0.0	0.0504	0.0259
8.0	23129	8.0	23129	0.2380	0.1911	0.6312
8.0	23129	9.0	23714	0.5223	0.0069	0.0096
8.0	23129	10.0	21232	0.0320	0.2930	0.2280
9.0	23714	9.0	23714	0.2605	0.2318	0.0822
9.0	23714	10.0	21232	0.7287	0.2820	0.0501
10.0	21232	10.0	21232	0.0056	1.5771	0.0580

Appendix XVIII
Matrix Elements of (Uλ)2 for $CfCl_3$ with Ground State, J1 = 7.5

J2	LEVEL	(U2)2	(U4)2	(U6)2
5.5	6453	0.8901	0.0980	0.6502
4.5	6648	0.0	0.5942	0.1522
6.5	8103	0.2098	0.3719	0.5062
5.5	11585	0.1648	0.6136	0.0843
1.5	12210	0.0	0.0	0.0289
4.5	12866	0.0	0.0308	0.6364
3.5	13233	0.0	0.1968	0.6326
3.5	14522	0.0	0.0351	0.1729
2.5	14866	0.0	0.0	0.1727
7.5	16172	0.0258	0.0004	0.4320
2.5	16343	0.0	0.0	0.2427
0.5	16810	0.0	0.0	0.0
2.5	19980	0.0	0.0	0.0336
8.5	20869	0.0798	0.0432	0.5011
4.5	21838	0.0	0.0321	0.0589
5.5	22021	0.0003	0.0475	0.0329
10.5	22247	0.0	0.0819	0.3959
1.5	22273	0.0	0.0	0.1451
9.5	22409	0.0001	0.1379	0.5524
3.5	22646	0.0	0.4463	0.0142
6.5	23176	0.0616	0.0411	0.0722
5.5	24484	0.0004	0.0073	0.0929
4.5	25562	0.0	0.0046	0.0069
1.5	26913	0.0	0.0	0.0252
3.5	27493	0.0	0.0204	0.0035
7.5	27614	0.0143	0.0153	0.0220
4.5	27784	0.0	0.0070	0.0095
2.5	28379	0.0	0.0	0.0001
7.5	29135	0.0176	0.0000	0.0016
5.5	29517	0.0398	0.0121	0.0005
3.5	29608	0.0	0.0084	0.0022
2.5	29641	0.0	0.0	0.0011
1.5	29865	0.0	0.0	0.0177
2.5	30181	0.0	0.0	0.0274
3.5	30192	0.0	0.1047	0.0015
6.5	30306	0.0178	0.0405	0.0019
0.5	31142	0.0	0.0	0.0
8.5	31430	0.0037	0.0018	0.0003

Appendix XVIII (Continued)
Matrix Elements of (Uλ)2 for $CfCl_3$ (to 32000 cm^{-1})

J1	LEVEL 1	J2	LEVEL 2	(U2)2	(U4)2	(U6)2
0.5	16810	1.5	12210	0.0313	0.0	0.0
0.5	16810	1.5	22273	0.0719	0.0	0.0
0.5	16810	1.5	26913	0.1045	0.0	0.0
0.5	16810	1.5	29865	0.0056	0.0	0.0
0.5	31142	1.5	12210	0.0048	0.0	0.0
0.5	31142	1.5	22273	0.0046	0.0	0.0
0.5	31142	1.5	26913	0.0034	0.0	0.0
0.5	31142	1.5	29865	0.0964	0.0	0.0
0.5	16810	2.5	14866	0.0585	0.0	0.0
0.5	16810	2.5	16343	0.0382	0.0	0.0
0.5	16810	2.5	19980	0.0804	0.0	0.0
0.5	16810	2.5	28379	0.0096	0.0	0.0
0.5	16810	2.5	29641	0.0107	0.0	0.0
0.5	16810	2.5	30181	0.0012	0.0	0.0
0.5	31142	2.5	14866	0.0083	0.0	0.0
0.5	31142	2.5	16343	0.0115	0.0	0.0
0.5	31142	2.5	19980	0.0268	0.0	0.0
0.5	31142	2.5	28379	0.0269	0.0	0.0
0.5	31142	2.5	29641	0.0076	0.0	0.0
0.5	31142	2.5	30181	0.0945	0.0	0.0
0.5	16810	3.5	13233	0.0	0.0774	0.0
0.5	16810	3.5	14522	0.0	0.0626	0.0
0.5	16810	3.5	22646	0.0	0.1343	0.0
0.5	16810	3.5	27493	0.0	0.0349	0.0
0.5	16810	3.5	29608	0.0	0.0001	0.0
0.5	16810	3.5	30192	0.0	0.0005	0.0
0.5	31142	3.5	13233	0.0	0.0009	0.0
0.5	31142	3.5	14522	0.0	0.0039	0.0
0.5	31142	3.5	22646	0.0	0.0171	0.0
0.5	31142	3.5	27493	0.0	0.0987	0.0
0.5	31142	3.5	29608	0.0	0.0002	0.0
0.5	31142	3.5	30192	0.0	0.0557	0.0
0.5	16810	4.5	6648	0.0	0.0476	0.0
0.5	16810	4.5	12866	0.0	0.0811	0.0
0.5	16810	4.5	21838	0.0	0.0273	0.0
0.5	16810	4.5	25562	0.0	0.0147	0.0
0.5	16810	4.5	27784	0.0	0.0014	0.0
0.5	31142	4.5	6648	0.0	0.0149	0.0
0.5	31142	4.5	12866	0.0	0.0000	0.0
0.5	31142	4.5	21838	0.0	0.0424	0.0
0.5	31142	4.5	25562	0.0	0.1719	0.0
0.5	31142	4.5	27784	0.0	0.0116	0.0
0.5	16810	5.5	6453	0.0	0.0	0.1544
0.5	16810	5.5	11585	0.0	0.0	0.0915
0.5	16810	5.5	22021	0.0	0.0	0.0253
0.5	16810	5.5	24484	0.0	0.0	0.0181

Appendix XVIII (Continued)

J1	LEVEL 1	J2	LEVEL 2	(U2)2	(U4)2	(U6)2
0.5	16810	5.5	29517	0.0	0.0	0.0012
0.5	31142	5.5	6453	0.0	0.0	0.0031
0.5	31142	5.5	11585	0.0	0.0	0.0028
0.5	31142	5.5	22021	0.0	0.0	0.0877
0.5	31142	5.5	24484	0.0	0.0	0.0679
0.5	31142	5.5	29517	0.0	0.0	0.0000
0.5	16810	6.5	8103	0.0	0.0	0.0710
0.5	16810	6.5	23176	0.0	0.0	0.0006
0.5	16810	6.5	30306	0.0	0.0	0.0001
0.5	31142	6.5	8103	0.0	0.0	0.0470
0.5	31142	6.5	23176	0.0	0.0	0.0012
0.5	31142	6.5	30306	0.0	0.0	0.0044
1.5	12210	1.5	12210	0.1535	0.0	0.0
1.5	12210	1.5	22273	0.1449	0.0	0.0
1.5	12210	1.5	26913	0.0004	0.0	0.0
1.5	12210	1.5	29865	0.0812	0.0	0.0
1.5	22273	1.5	22273	0.0928	0.0	0.0
1.5	22273	1.5	26913	0.0153	0.0	0.0
1.5	22273	1.5	29865	0.0034	0.0	0.0
1.5	26913	1.5	26913	0.1269	0.0	0.0
1.5	26913	1.5	29865	0.0036	0.0	0.0
1.5	29865	1.5	29865	0.0159	0.0	0.0
1.5	12210	2.5	14866	0.1287	0.0776	0.0
1.5	12210	2.5	16343	0.0422	0.0025	0.0
1.5	12210	2.5	19980	0.0179	0.0002	0.0
1.5	12210	2.5	28379	0.0164	0.0283	0.0
1.5	12210	2.5	29641	0.0002	0.0689	0.0
1.5	12210	2.5	30181	0.0003	0.0078	0.0
1.5	22273	2.5	14866	0.0017	0.1514	0.0
1.5	22273	2.5	16343	0.2113	0.0261	0.0
1.5	22273	2.5	19980	0.0569	0.0271	0.0
1.5	22273	2.5	28379	0.0013	0.0017	0.0
1.5	22273	2.5	29641	0.0015	0.0259	0.0
1.5	22273	2.5	30181	0.1328	0.0276	0.0
1.5	26913	2.5	14866	0.0026	0.0045	0.0
1.5	26913	2.5	16343	0.0253	0.0215	0.0
1.5	26913	2.5	19980	0.0436	0.0000	0.0
1.5	26913	2.5	28379	0.0022	0.0041	0.0
1.5	26913	2.5	29641	0.0635	0.0383	0.0
1.5	26913	2.5	30181	0.0307	0.0181	0.0
1.5	29865	2.5	14866	0.0003	0.0371	0.0
1.5	29865	2.5	16343	0.0081	0.0000	0.0
1.5	29865	2.5	19980	0.0305	0.0037	0.0
1.5	29865	2.5	28379	0.1119	0.0037	0.0
1.5	29865	2.5	29641	0.0051	0.0618	0.0
1.5	29865	2.5	30181	0.0027	0.0000	0.0
1.5	12210	3.5	13233	0.0142	0.0027	0.0
1.5	12210	3.5	14522	0.1621	0.2296	0.0
1.5	12210	3.5	22646	0.0288	0.1048	0.0

Appendix XVIII (Continued)

J1	LEVEL 1	J2	LEVEL 2	(U2)2	(U4)2	(U6)2
1.5	12210	3.5	27493	0.0432	0.0003	0.0
1.5	12210	3.5	29608	0.0008	0.0056	0.0
1.5	12210	3.5	30192	0.0056	0.0166	0.0
1.5	22273	3.5	13233	0.0080	0.0544	0.0
1.5	22273	3.5	14522	0.0051	0.0043	0.0
1.5	22273	3.5	22646	0.3486	0.0142	0.0
1.5	22273	3.5	27493	0.0052	0.0499	0.0
1.5	22273	3.5	29608	0.0002	0.0019	0.0
1.5	22273	3.5	30192	0.0037	0.0273	0.0
1.5	26913	3.5	13233	0.0550	0.0180	0.0
1.5	26913	3.5	14522	0.0422	0.0208	0.0
1.5	26913	3.5	22646	0.0730	0.0029	0.0
1.5	26913	3.5	27493	0.0064	0.0664	0.0
1.5	26913	3.5	29608	0.0082	0.0906	0.0
1.5	26913	3.5	30192	0.0637	0.0583	0.0
1.5	29865	3.5	13233	0.0245	0.0042	0.0
1.5	29865	3.5	14522	0.0005	0.0461	0.0
1.5	29865	3.5	22646	0.0306	0.0001	0.0
1.5	29865	3.5	27493	0.0886	0.0022	0.0
1.5	29865	3.5	29608	0.0059	0.0001	0.0
1.5	29865	3.5	30192	0.0585	0.0422	0.0
1.5	12210	4.5	6648	0.0	0.2038	0.0338
1.5	12210	4.5	12866	0.0	0.0489	0.1483
1.5	12210	4.5	21838	0.0	0.0074	0.0000
1.5	12210	4.5	25562	0.0	0.0273	0.0139
1.5	12210	4.5	27784	0.0	0.0262	0.3313
1.5	22273	4.5	6648	0.0	0.0691	0.0003
1.5	22273	4.5	12866	0.0	0.0001	0.0700
1.5	22273	4.5	21838	0.0	0.0238	0.0470
1.5	22273	4.5	25562	0.0	0.0174	0.0071
1.5	22273	4.5	27784	0.0	0.0233	0.0333
1.5	26913	4.5	6648	0.0	0.0479	0.0672
1.5	26913	4.5	12866	0.0	0.0120	0.0239
1.5	26913	4.5	21838	0.0	0.0997	0.1049
1.5	26913	4.5	25562	0.0	0.0018	0.0015
1.5	26913	4.5	27784	0.0	0.0465	0.0903
1.5	29865	4.5	6648	0.0	0.0008	0.0789
1.5	29865	4.5	12866	0.0	0.0000	0.0172
1.5	29865	4.5	21838	0.0	0.1632	0.0109
1.5	29865	4.5	25562	0.0	0.0024	0.0207
1.5	29865	4.5	27784	0.0	0.1137	0.0285
1.5	12210	5.5	6453	0.0	0.0923	0.0350
1.5	12210	5.5	11585	0.0	0.0443	0.0000
1.5	12210	5.5	22021	0.0	0.0017	0.0009
1.5	12210	5.5	24484	0.0	0.1019	0.0020
1.5	12210	5.5	29517	0.0	0.0613	0.0010
1.5	22273	5.5	6453	0.0	0.0597	0.0154
1.5	22273	5.5	11585	0.0	0.2604	0.0000
1.5	22273	5.5	22021	0.0	0.0646	0.0353

Appendix XVIII (Continued)

J1	LEVEL 1	J2	LEVEL 2	(U2)2	(U4)2	(U6)2
1.5	22273	5.5	24484	0.0	0.0220	0.0047
1.5	22273	5.5	29517	0.0	0.0285	0.0032
1.5	26913	5.5	6453	0.0	0.0359	0.0206
1.5	26913	5.5	11585	0.0	0.0102	0.0004
1.5	26913	5.5	22021	0.0	0.0387	0.0013
1.5	26913	5.5	24484	0.0	0.1013	0.0300
1.5	26913	5.5	29517	0.0	0.0011	0.0069
1.5	29865	5.5	6453	0.0	0.0400	0.0104
1.5	29865	5.5	11585	0.0	0.0248	0.0056
1.5	29865	5.5	22021	0.0	0.0037	0.0359
1.5	29865	5.5	24484	0.0	0.0280	0.0054
1.5	29865	5.5	29517	0.0	0.0101	0.0162
1.5	12210	6.5	8103	0.0	0.0	0.1869
1.5	12210	6.5	23176	0.0	0.0	0.1688
1.5	12210	6.5	30306	0.0	0.0	0.0000
1.5	22273	6.5	8103	0.0	0.0	0.0767
1.5	22273	6.5	23176	0.0	0.0	0.0549
1.5	22273	6.5	30306	0.0	0.0	0.0219
1.5	26913	6.5	8103	0.0	0.0	0.0988
1.5	26913	6.5	23176	0.0	0.0	0.1189
1.5	26913	6.5	30306	0.0	0.0	0.0587
1.5	29865	6.5	8103	0.0	0.0	0.0676
1.5	29865	6.5	23176	0.0	0.0	0.0073
1.5	29865	6.5	30306	0.0	0.0	0.0025
1.5	12210	7.5	149	0.0	0.0	0.0289
1.5	12210	7.5	16172	0.0	0.0	0.0196
1.5	12210	7.5	27614	0.0	0.0	0.2330
1.5	12210	7.5	29135	0.0	0.0	0.0287
1.5	22273	7.5	149	0.0	0.0	0.1451
1.5	22273	7.5	16172	0.0	0.0	0.0005
1.5	22273	7.5	27614	0.0	0.0	0.0174
1.5	22273	7.5	29135	0.0	0.0	0.0222
1.5	26913	7.5	149	0.0	0.0	0.0252
1.5	26913	7.5	16172	0.0	0.0	0.1216
1.5	26913	7.5	27614	0.0	0.0	0.0585
1.5	26913	7.5	29135	0.0	0.0	0.0138
1.5	29865	7.5	149	0.0	0.0	0.0177
1.5	29865	7.5	16172	0.0	0.0	0.0016
1.5	29865	7.5	27614	0.0	0.0	0.0202
1.5	29865	7.5	29135	0.0	0.0	0.0890
2.5	14866	2.5	14866	0.2269	0.2230	0.0
2.5	14866	2.5	16343	0.0464	0.0342	0.0
2.5	14866	2.5	19980	0.1349	0.0451	0.0
2.5	14866	2.5	28379	0.0029	0.0000	0.0
2.5	14866	2.5	29641	0.0008	0.0018	0.0
2.5	14866	2.5	30181	0.0162	0.0004	0.0
2.5	16343	2.5	16343	0.0752	0.1670	0.0
2.5	16343	2.5	19980	0.2849	0.1428	0.0
2.5	16343	2.5	28379	0.0534	0.0036	0.0

Appendix XVIII (Continued)

J1	LEVEL 1	J2	LEVEL 2	(U2)2	(U4)2	(U6)2
2.5	16343	2.5	29641	0.0025	0.0063	0.0
2.5	16343	2.5	30181	0.0074	0.0039	0.0
2.5	19980	2.5	19980	0.1701	0.0044	0.0
2.5	19980	2.5	28379	0.0056	0.0437	0.0
2.5	19980	2.5	29641	0.0003	0.0074	0.0
2.5	19980	2.5	30181	0.0018	0.0089	0.0
2.5	28379	2.5	28379	0.0481	0.1176	0.0
2.5	28379	2.5	29641	0.0089	0.0242	0.0
2.5	28379	2.5	30181	0.1126	0.0491	0.0
2.5	29641	2.5	29641	0.0171	0.0001	0.0
2.5	29641	2.5	30181	0.0694	0.0178	0.0
2.5	30181	2.5	30181	0.1681	0.0319	0.0
2.5	14866	3.5	13233	0.1026	0.1421	0.1835
2.5	14866	3.5	14522	0.4319	0.0183	0.0061
2.5	14866	3.5	22646	0.0009	0.0802	0.0379
2.5	14866	3.5	27493	0.0067	0.0079	0.0015
2.5	14866	3.5	29608	0.0171	0.0156	0.0053
2.5	14866	3.5	30192	0.0004	0.0050	0.0019
2.5	16343	3.5	13233	0.0000	0.1097	0.0939
2.5	16343	3.5	14522	0.0004	0.1217	0.3640
2.5	16343	3.5	22646	0.0749	0.0677	0.0070
2.5	16343	3.5	27493	0.0008	0.0039	0.0358
2.5	16343	3.5	29608	0.0102	0.0239	0.0358
2.5	16343	3.5	30192	0.0065	0.0953	0.0117
2.5	19980	3.5	13233	0.3815	0.0153	0.0641
2.5	19980	3.5	14522	0.0001	0.1727	0.0182
2.5	19980	3.5	22646	0.4412	0.0634	0.0015
2.5	19980	3.5	27493	0.0003	0.0106	0.0001
2.5	19980	3.5	29608	0.0009	0.0037	0.0271
2.5	19980	3.5	30192	0.0221	0.0024	0.0085
2.5	28379	3.5	13233	0.0140	0.0015	0.0001
2.5	28379	3.5	14522	0.0000	0.0032	0.0250
2.5	28379	3.5	22646	0.0074	0.0137	0.0044
2.5	28379	3.5	27493	0.0175	0.0064	0.0054
2.5	28379	3.5	29608	0.0704	0.0109	0.0087
2.5	28379	3.5	30192	0.0023	0.1098	0.0012
2.5	29641	3.5	13233	0.0094	0.0284	0.0078
2.5	29641	3.5	14522	0.0174	0.0070	0.0015
2.5	29641	3.5	22646	0.0014	0.0064	0.0048
2.5	29641	3.5	27493	0.0456	0.0365	0.0000
2.5	29641	3.5	29608	0.0945	0.0255	0.0235
2.5	29641	3.5	30192	0.0520	0.0085	0.0026
2.5	30181	3.5	13233	0.1125	0.0248	0.0158
2.5	30181	3.5	14522	0.0000	0.0149	0.0027
2.5	30181	3.5	22646	0.0038	0.0050	0.0001
2.5	30181	3.5	27493	0.0563	0.0901	0.0067
2.5	30181	3.5	29608	0.2092	0.1648	0.0454
2.5	30181	3.5	30192	0.0802	0.0119	0.0051
2.5	14866	4.5	6648	0.0272	0.0283	0.0478

Appendix XVIII (Continued)

J1	LEVEL 1	J2	LEVEL 2	(U2)2	(U4)2	(U6)2
2.5	14866	4.5	12866	0.0281	0.0153	0.3467
2.5	14866	4.5	21838	0.0388	0.0003	0.0109
2.5	14866	4.5	25562	0.0160	0.0011	0.0251
2.5	14866	4.5	27784	0.0071	0.0011	0.0000
2.5	16343	4.5	6648	0.0906	0.0018	0.0252
2.5	16343	4.5	12866	0.1730	0.2013	0.0600
2.5	16343	4.5	21838	0.0553	0.0323	0.0010
2.5	16343	4.5	25562	0.0004	0.0042	0.0030
2.5	16343	4.5	27784	0.0045	0.0012	0.0452
2.5	19980	4.5	6648	0.3285	0.0724	0.0348
2.5	19980	4.5	12866	0.0530	0.2235	0.0756
2.5	19980	4.5	21838	0.0082	0.0223	0.0065
2.5	19980	4.5	25562	0.0003	0.0003	0.0004
2.5	19980	4.5	27784	0.0020	0.0028	0.0047
2.5	28379	4.5	6648	0.0005	0.0096	0.1371
2.5	28379	4.5	12866	0.0052	0.0002	0.0009
2.5	28379	4.5	21838	0.0003	0.0001	0.0333
2.5	28379	4.5	25562	0.1559	0.0190	0.2011
2.5	28379	4.5	27784	0.0115	0.0013	0.0198
2.5	29641	4.5	6648	0.0347	0.0283	0.0837
2.5	29641	4.5	12866	0.0010	0.0011	0.1118
2.5	29641	4.5	21838	0.0046	0.0285	0.0583
2.5	29641	4.5	25562	0.0011	0.0015	0.0062
2.5	29641	4.5	27784	0.0026	0.0067	0.0882
2.5	30181	4.5	6648	0.0038	0.0062	0.0054
2.5	30181	4.5	12866	0.0961	0.1642	0.0687
2.5	30181	4.5	21838	0.2168	0.0157	0.0006
2.5	30181	4.5	25562	0.0012	0.0094	0.0023
2.5	30181	4.5	27784	0.0019	0.0022	0.1608
2.5	14866	5.5	6453	0.0	0.0159	0.1133
2.5	14866	5.5	11585	0.0	0.0709	0.1403
2.5	14866	5.5	22021	0.0	0.0267	0.0011
2.5	14866	5.5	24484	0.0	0.0013	0.0577
2.5	14866	5.5	29517	0.0	0.0295	0.0101
2.5	16343	5.5	6453	0.0	0.0272	0.0675
2.5	16343	5.5	11585	0.0	0.0926	0.0346
2.5	16343	5.5	22021	0.0	0.0004	0.0068
2.5	16343	5.5	24484	0.0	0.0099	0.0063
2.5	16343	5.5	29517	0.0	0.0136	0.0111
2.5	19980	5.5	6453	0.0	0.3850	0.0511
2.5	19980	5.5	11585	0.0	0.0560	0.0788
2.5	19980	5.5	22021	0.0	0.0081	0.1224
2.5	19980	5.5	24484	0.0	0.0081	0.0032
2.5	19980	5.5	29517	0.0	0.0277	0.0119
2.5	28379	5.5	6453	0.0	0.0162	0.0173
2.5	28379	5.5	11585	0.0	0.0063	0.0092
2.5	28379	5.5	22021	0.0	0.0406	0.0191
2.5	28379	5.5	24484	0.0	0.1266	0.2328
2.5	28379	5.5	29517	0.0	0.0004	0.0032

Appendix XVIII (Continued)

J1	LEVEL 1	J2	LEVEL 2	(U2)2	(U4)2	(U6)2
2.5	29641	5.5	6453	0.0	0.0205	0.0271
2.5	29641	5.5	11585	0.0	0.0000	0.0194
2.5	29641	5.5	22021	0.0	0.0186	0.0000
2.5	29641	5.5	24484	0.0	0.0397	0.0237
2.5	29641	5.5	29517	0.0	0.0016	0.0357
2.5	30181	5.5	6453	0.0	0.0361	0.0212
2.5	30181	5.5	11585	0.0	0.0123	0.0276
2.5	30181	5.5	22021	0.0	0.2318	0.1215
2.5	30181	5.5	24484	0.0	0.0202	0.0003
2.5	30181	5.5	29517	0.0	0.0389	0.0010
2.5	14866	6.5	8103	0.0	0.1561	0.0003
2.5	14866	6.5	23176	0.0	0.0000	0.0071
2.5	14866	6.5	30306	0.0	0.0004	0.1374
2.5	16343	6.5	8103	0.0	0.1051	0.2703
2.5	16343	6.5	23176	0.0	0.0130	0.0005
2.5	16343	6.5	30306	0.0	0.0043	0.0000
2.5	19980	6.5	8103	0.0	0.0546	0.0269
2.5	19980	6.5	23176	0.0	0.0062	0.0024
2.5	19980	6.5	30306	0.0	0.0164	0.0022
2.5	28379	6.5	8103	0.0	0.0092	0.0458
2.5	28379	6.5	23176	0.0	0.1997	0.0117
2.5	28379	6.5	30306	0.0	0.0000	0.1608
2.5	29641	6.5	8103	0.0	0.0231	0.0046
2.5	29641	6.5	23176	0.0	0.0018	0.0007
2.5	29641	6.5	30306	0.0	0.0101	0.1240
2.5	30181	6.5	8103	0.0	0.0583	0.1177
2.5	30181	6.5	23176	0.0	0.0000	0.0206
2.5	30181	6.5	30306	0.0	0.0189	0.0082
2.5	14866	7.5	149	0.0	0.0	0.1727
2.5	14866	7.5	16172	0.0	0.0	0.0135
2.5	14866	7.5	27614	0.0	0.0	0.0751
2.5	14866	7.5	29135	0.0	0.0	0.0140
2.5	16343	7.5	149	0.0	0.0	0.2427
2.5	16343	7.5	16172	0.0	0.0	0.0063
2.5	16343	7.5	27614	0.0	0.0	0.0419
2.5	16343	7.5	29135	0.0	0.0	0.0343
2.5	19980	7.5	149	0.0	0.0	0.0336
2.5	19980	7.5	16172	0.0	0.0	0.0000
2.5	19980	7.5	27614	0.0	0.0	0.0287
2.5	19980	7.5	29135	0.0	0.0	0.0266
2.5	28379	7.5	149	0.0	0.0	0.0001
2.5	28379	7.5	16172	0.0	0.0	0.1991
2.5	28379	7.5	27614	0.0	0.0	0.0242
2.5	28379	7.5	29135	0.0	0.0	0.0018
2.5	29641	7.5	149	0.0	0.0	0.0011
2.5	29641	7.5	16172	0.0	0.0	0.0977
2.5	29641	7.5	27614	0.0	0.0	0.0476
2.5	29641	7.5	29135	0.0	0.0	0.0114
2.5	30181	7.5	149	0.0	0.0	0.0274

Appendix XVIII (Continued)

J1	LEVEL 1	J2	LEVEL 2	(U2)2	(U4)2	(U6)2
2.5	30181	7.5	16172	0.0	0.0	0.0004
2.5	30181	7.5	27614	0.0	0.0	0.0092
2.5	30181	7.5	29135	0.0	0.0	0.0010
2.5	14866	8.5	20869	0.0	0.0	0.0385
2.5	14866	8.5	31430	0.0	0.0	0.0768
2.5	16343	8.5	20869	0.0	0.0	0.0078
2.5	16343	8.5	31430	0.0	0.0	0.0009
2.5	19980	8.5	20869	0.0	0.0	0.0292
2.5	19980	8.5	31430	0.0	0.0	0.0124
2.5	28379	8.5	20869	0.0	0.0	0.0066
2.5	28379	8.5	31430	0.0	0.0	0.0149
2.5	29641	8.5	20869	0.0	0.0	0.0132
2.5	29641	8.5	31430	0.0	0.0	0.0256
2.5	30181	8.5	20869	0.0	0.0	0.0866
2.5	30181	8.5	31430	0.0	0.0	0.0959
3.5	13233	3.5	13233	0.0006	0.0064	0.0030
3.5	13233	3.5	14522	0.0494	0.1634	0.0113
3.5	13233	3.5	22646	0.0561	0.3149	0.0109
3.5	13233	3.5	27493	0.0061	0.0144	0.0035
3.5	13233	3.5	29608	0.0000	0.0021	0.0146
3.5	13233	3.5	30192	0.0327	0.0338	0.0002
3.5	14522	3.5	14522	0.2108	0.0712	0.0804
3.5	14522	3.5	22646	0.0371	0.0000	0.1671
3.5	14522	3.5	27493	0.0251	0.0158	0.0027
3.5	14522	3.5	29608	0.0072	0.0000	0.0009
3.5	14522	3.5	30192	0.0006	0.0053	0.0033
3.5	22646	3.5	22646	0.0921	0.0028	0.0349
3.5	22646	3.5	27493	0.0157	0.0001	0.0004
3.5	22646	3.5	29608	0.0200	0.0613	0.0042
3.5	22646	3.5	30192	0.0932	0.0107	0.0023
3.5	27493	3.5	27493	0.1144	0.0390	0.0065
3.5	27493	3.5	29608	0.0069	0.0277	0.0049
3.5	27493	3.5	30192	0.0248	0.0058	0.0280
3.5	29608	3.5	29608	0.0971	0.1992	0.0051
3.5	29608	3.5	30192	0.0680	0.0026	0.0032
3.5	30192	3.5	30192	0.0637	0.0009	0.0043
3.5	13233	4.5	6648	0.0105	0.0014	0.1278
3.5	13233	4.5	12866	0.3665	0.0846	0.0455
3.5	13233	4.5	21838	0.0173	0.0079	0.0895
3.5	13233	4.5	25562	0.0057	0.0405	0.0061
3.5	13233	4.5	27784	0.0040	0.0070	0.0017
3.5	14522	4.5	6648	0.0552	0.2693	0.3787
3.5	14522	4.5	12866	0.1460	0.0250	0.0097
3.5	14522	4.5	21838	0.0173	0.0341	0.0036
3.5	14522	4.5	25562	0.0017	0.0123	0.0187
3.5	14522	4.5	27784	0.0000	0.0030	0.0547
3.5	22646	4.5	6648	0.2076	0.1241	0.0142
3.5	22646	4.5	12866	0.1160	0.0012	0.1825
3.5	22646	4.5	21838	0.0023	0.0020	0.0262

Appendix XVIII (Continued)

J1	LEVEL 1	J2	LEVEL 2	(U2)2	(U4)2	(U6)2
3.5	22646	4.5	25562	0.0000	0.0002	0.0014
3.5	22646	4.5	27784	0.0020	0.0036	0.0233
3.5	27493	4.5	6648	0.0986	0.1065	0.1057
3.5	27493	4.5	12866	0.0001	0.0000	0.0085
3.5	27493	4.5	21838	0.0111	0.0026	0.3615
3.5	27493	4.5	25562	0.0347	0.1055	0.0240
3.5	27493	4.5	27784	0.2363	0.0264	0.0025
3.5	29608	4.5	6648	0.0045	0.0000	0.0028
3.5	29608	4.5	12866	0.0089	0.0040	0.0152
3.5	29608	4.5	21838	0.0040	0.1061	0.0009
3.5	29608	4.5	25562	0.0037	0.0699	0.0500
3.5	29608	4.5	27784	0.0147	0.0150	0.0274
3.5	30192	4.5	6648	0.0051	0.0000	0.0249
3.5	30192	4.5	12866	0.0224	0.0074	0.0032
3.5	30192	4.5	21838	0.2477	0.2605	0.0904
3.5	30192	4.5	25562	0.0068	0.0004	0.0031
3.5	30192	4.5	27784	0.1037	0.0015	0.0563
3.5	13233	5.5	6453	0.0953	0.0732	0.0136
3.5	13233	5.5	11585	0.1645	0.0009	0.2074
3.5	13233	5.5	22021	0.0806	0.0013	0.0465
3.5	13233	5.5	24484	0.0119	0.0051	0.0077
3.5	13233	5.5	29517	0.0054	0.0246	0.0181
3.5	14522	5.5	6453	0.1394	0.0174	0.4344
3.5	14522	5.5	11585	0.0385	0.0521	0.0144
3.5	14522	5.5	22021	0.0030	0.0231	0.0001
3.5	14522	5.5	24484	0.0190	0.0157	0.0550
3.5	14522	5.5	29517	0.0005	0.0375	0.0123
3.5	22646	5.5	6453	0.6706	0.0005	0.0013
3.5	22646	5.5	11585	0.2617	0.3328	0.1142
3.5	22646	5.5	22021	0.0209	0.0068	0.0444
3.5	22646	5.5	24484	0.0067	0.0136	0.0384
3.5	22646	5.5	29517	0.0174	0.1003	0.0082
3.5	27493	5.5	6453	0.0697	0.0008	0.1447
3.5	27493	5.5	11585	0.0592	0.0064	0.0448
3.5	27493	5.5	22021	0.0000	0.0095	0.0015
3.5	27493	5.5	24484	0.0069	0.0191	0.0889
3.5	27493	5.5	29517	0.0309	0.0085	0.0017
3.5	29608	5.5	6453	0.0146	0.0006	0.0015
3.5	29608	5.5	11585	0.0057	0.0158	0.0128
3.5	29608	5.5	22021	0.1430	0.0796	0.0070
3.5	29608	5.5	24484	0.0572	0.0417	0.1113
3.5	29608	5.5	29517	0.0064	0.0391	0.0640
3.5	30192	5.5	6453	0.0904	0.0147	0.0197
3.5	30192	5.5	11585	0.3238	0.0027	0.0011
3.5	30192	5.5	22021	0.1142	0.0158	0.4714
3.5	30192	5.5	24484	0.0105	0.0002	0.0009
3.5	30192	5.5	29517	0.0172	0.2156	0.0043
3.5	13233	6.5	8103	0.0	0.3493	0.0102
3.5	13233	6.5	23176	0.0	0.0174	0.0343

Appendix XVIII (Continued)

J1	LEVEL 1	J2	LEVEL 2	(U2)2	(U4)2	(U6)2
3.5	13233	6.5	30306	0.0	0.0019	0.0017
3.5	14522	6.5	8103	0.0	0.0315	0.1432
3.5	14522	6.5	23176	0.0	0.0429	0.0149
3.5	14522	6.5	30306	0.0	0.0131	0.0053
3.5	22646	6.5	8103	0.0	0.2119	0.2678
3.5	22646	6.5	23176	0.0	0.0583	0.0056
3.5	22646	6.5	30306	0.0	0.0033	0.0629
3.5	27493	6.5	8103	0.0	0.0552	0.0020
3.5	27493	6.5	23176	0.0	0.1916	0.0032
3.5	27493	6.5	30306	0.0	0.0977	0.0002
3.5	29608	6.5	8103	0.0	0.0045	0.0003
3.5	29608	6.5	23176	0.0	0.0564	0.0696
3.5	29608	6.5	30306	0.0	0.0325	0.0605
3.5	30192	6.5	8103	0.0	0.1361	0.0100
3.5	30192	6.5	23176	0.0	0.1012	0.0003
3.5	30192	6.5	30306	0.0	0.0101	0.0571
3.5	13233	7.5	149	0.0	0.1968	0.6326
3.5	13233	7.5	16172	0.0	0.0081	0.0059
3.5	13233	7.5	27614	0.0	0.0008	0.0020
3.5	13233	7.5	29135	0.0	0.0350	0.0241
3.5	14522	7.5	149	0.0	0.0351	0.1729
3.5	14522	7.5	16172	0.0	0.0635	0.0336
3.5	14522	7.5	27614	0.0	0.0010	0.0898
3.5	14522	7.5	29135	0.0	0.0540	0.0066
3.5	22646	7.5	149	0.0	0.4463	0.0142
3.5	22646	7.5	16172	0.0	0.0098	0.0212
3.5	22646	7.5	27614	0.0	0.0194	0.0158
3.5	22646	7.5	29135	0.0	0.0008	0.0948
3.5	27493	7.5	149	0.0	0.0204	0.0035
3.5	27493	7.5	16172	0.0	0.0812	0.0475
3.5	27493	7.5	27614	0.0	0.0006	0.0163
3.5	27493	7.5	29135	0.0	0.1053	0.2188
3.5	29608	7.5	149	0.0	0.0084	0.0022
3.5	29608	7.5	16172	0.0	0.0753	0.8752
3.5	29608	7.5	27614	0.0	0.0053	0.0665
3.5	29608	7.5	29135	0.0	0.0224	0.0032
3.5	30192	7.5	149	0.0	0.1047	0.0015
3.5	30192	7.5	16172	0.0	0.0627	0.0273
3.5	30192	7.5	27614	0.0	0.0395	0.0429
3.5	30192	7.5	29135	0.0	0.0110	0.0046
3.5	13233	8.5	20869	0.0	0.0	0.0193
3.5	13233	8.5	31430	0.0	0.0	0.0804
3.5	14522	8.5	20869	0.0	0.0	0.0158
3.5	14522	8.5	31430	0.0	0.0	0.0433
3.5	22646	8.5	20869	0.0	0.0	0.0006
3.5	22646	8.5	31430	0.0	0.0	0.0121
3.5	27493	8.5	20869	0.0	0.0	0.0002
3.5	27493	8.5	31430	0.0	0.0	0.0048
3.5	29608	8.5	20869	0.0	0.0	0.1162

Appendix XVIII (Continued)

J1	LEVEL 1	J2	LEVEL 2	(U2)2	(U4)2	(U6)2
3.5	29608	8.5	31430	0.0	0.0	0.1528
3.5	30192	8.5	20869	0.0	0.0	0.0285
3.5	30192	8.5	31430	0.0	0.0	0.0073
3.5	13233	9.5	22409	0.0	0.0	0.0180
3.5	14522	9.5	22409	0.0	0.0	0.0183
3.5	22646	9.5	22409	0.0	0.0	0.0262
3.5	27493	9.5	22409	0.0	0.0	0.0026
3.5	29608	9.5	22409	0.0	0.0	0.0205
3.5	30192	9.5	22409	0.0	0.0	0.1158
4.5	6648	4.5	6648	0.0692	0.1055	0.2956
4.5	6648	4.5	12866	0.0004	0.1082	0.1055
4.5	6648	4.5	21838	0.0042	0.0043	0.0017
4.5	6648	4.5	25562	0.0330	0.0333	0.0001
4.5	6648	4.5	27784	0.0025	0.0106	0.1542
4.5	12866	4.5	12866	0.2143	0.3267	0.0108
4.5	12866	4.5	21838	0.0916	0.0001	0.0036
4.5	12866	4.5	25562	0.0003	0.0019	0.0060
4.5	12866	4.5	27784	0.0023	0.0025	0.0068
4.5	21838	4.5	21838	0.0314	0.1415	0.4429
4.5	21838	4.5	25562	0.0224	0.0145	0.0136
4.5	21838	4.5	27784	0.0067	0.0205	0.0392
4.5	25562	4.5	25562	0.1398	0.0853	0.0741
4.5	25562	4.5	27784	0.0283	0.0947	0.0376
4.5	27784	4.5	27784	0.0110	0.1895	0.0601
4.5	6648	5.5	6453	0.4024	0.1398	0.0002
4.5	6648	5.5	11585	0.1271	0.0256	0.0020
4.5	6648	5.5	22021	0.0283	0.0000	0.0075
4.5	6648	5.5	24484	0.0081	0.0531	0.2795
4.5	6648	5.5	29517	0.0001	0.0001	0.0316
4.5	12866	5.5	6453	0.0179	0.0276	0.2722
4.5	12866	5.5	11585	0.0705	0.2529	0.1223
4.5	12866	5.5	22021	0.0042	0.1215	0.0045
4.5	12866	5.5	24484	0.0001	0.0035	0.0474
4.5	12866	5.5	29517	0.0006	0.0115	0.0012
4.5	21838	5.5	6453	0.0045	0.0252	0.0849
4.5	21838	5.5	11585	0.0474	0.0359	0.0566
4.5	21838	5.5	22021	0.5189	0.0582	0.0003
4.5	21838	5.5	24484	0.0788	0.0270	0.1180
4.5	21838	5.5	29517	0.0038	0.0005	0.0008
4.5	25562	5.5	6453	0.0012	0.0128	0.2128
4.5	25562	5.5	11585	0.0000	0.0009	0.0594
4.5	25562	5.5	22021	0.0321	0.0484	0.3771
4.5	25562	5.5	24484	0.5649	0.0568	0.0100
4.5	25562	5.5	29517	0.0132	0.0154	0.1675
4.5	27784	5.5	6453	0.0105	0.0006	0.0218
4.5	27784	5.5	11585	0.0005	0.0004	0.0134
4.5	27784	5.5	22021	0.0053	0.0122	0.0559
4.5	27784	5.5	24484	0.0245	0.1708	0.0459
4.5	27784	5.5	29517	0.0251	0.0252	0.0551

Appendix XVIII (Continued)

J1	LEVEL 1	J2	LEVEL 2	(U2)2	(U4)2	(U6)2
4.5	6648	6.5	8103	0.2201	0.0233	0.3166
4.5	6648	6.5	23176	0.0254	0.0722	0.2668
4.5	6648	6.5	30306	0.0019	0.0104	0.0783
4.5	12866	6.5	8103	0.3812	0.0787	0.0433
4.5	12866	6.5	23176	0.0235	0.0065	0.0498
4.5	12866	6.5	30306	0.0011	0.0126	0.0132
4.5	21838	6.5	8103	0.1217	0.0965	0.3710
4.5	21838	6.5	23176	0.0002	0.0002	0.3875
4.5	21838	6.5	30306	0.0553	0.0325	0.0020
4.5	25562	6.5	8103	0.0351	0.0303	0.0199
4.5	25562	6.5	23176	0.0054	0.1834	0.0498
4.5	25562	6.5	30306	0.0043	0.0182	0.0122
4.5	27784	6.5	8103	0.0000	0.0000	0.0000
4.5	27784	6.5	23176	0.0507	0.1082	0.0049
4.5	27784	6.5	30306	0.0614	0.0028	0.0000
4.5	6648	7.5	149	0.0	0.5942	0.1522
4.5	6648	7.5	16172	0.0	0.1790	0.0351
4.5	6648	7.5	27614	0.0	0.0290	0.1823
4.5	6648	7.5	29135	0.0	0.0003	0.0252
4.5	12866	7.5	149	0.0	0.0308	0.6364
4.5	12866	7.5	16172	0.0	0.0763	0.0311
4.5	12866	7.5	27614	0.0	0.0001	0.0127
4.5	12866	7.5	29135	0.0	0.0000	0.0142
4.5	21838	7.5	149	0.0	0.0321	0.0589
4.5	21838	7.5	16172	0.0	0.5238	0.0000
4.5	21838	7.5	27614	0.0	0.0009	0.1538
4.5	21838	7.5	29135	0.0	0.0128	0.0339
4.5	25562	7.5	149	0.0	0.0046	0.0069
4.5	25562	7.5	16172	0.0	0.0536	0.2545
4.5	25562	7.5	27614	0.0	0.2580	0.1250
4.5	25562	7.5	29135	0.0	0.0810	0.0158
4.5	27784	7.5	149	0.0	0.0070	0.0095
4.5	27784	7.5	16172	0.0	0.0270	0.0162
4.5	27784	7.5	27614	0.0	0.0000	0.0008
4.5	27784	7.5	29135	0.0	0.0114	0.0790
4.5	6648	8.5	20869	0.0	0.2954	0.0620
4.5	6648	8.5	31430	0.0	0.0139	0.0033
4.5	12866	8.5	20869	0.0	0.0570	0.0019
4.5	12866	8.5	31430	0.0	0.0452	0.1279
4.5	21838	8.5	20869	0.0	0.1267	0.0274
4.5	21838	8.5	31430	0.0	0.0068	0.0119
4.5	25562	8.5	20869	0.0	0.0641	0.0362
4.5	25562	8.5	31430	0.0	0.2875	0.0348
4.5	27784	8.5	20869	0.0	0.1270	0.0371
4.5	27784	8.5	31430	0.0	0.0736	0.1354
4.5	6648	9.5	22409	0.0	0.0	0.1437
4.5	12866	9.5	22409	0.0	0.0	0.0004
4.5	21838	9.5	22409	0.0	0.0	0.0485
4.5	25562	9.5	22409	0.0	0.0	0.0535

Appendix XVIII (Continued)

J1	LEVEL 1	J2	LEVEL 2	(U2)2	(U4)2	(U6)2
4.5	27784	9.5	22409	0.0	0.0	0.0018
4.5	6648	10.5	22247	0.0	0.0	0.6062
4.5	12866	10.5	22247	0.0	0.0	0.0440
4.5	21838	10.5	22247	0.0	0.0	0.2414
4.5	25562	10.5	22247	0.0	0.0	0.1534
4.5	27784	10.5	22247	0.0	0.0	0.0246
5.5	6453	5.5	6453	0.0162	0.1589	0.3277
5.5	6453	5.5	11585	0.2538	0.0819	0.0045
5.5	6453	5.5	22021	0.0023	0.0001	0.0569
5.5	6453	5.5	24484	0.0207	0.0196	0.0058
5.5	6453	5.5	29517	0.0307	0.0126	0.2233
5.5	11585	5.5	11585	0.0057	0.1936	0.8442
5.5	11585	5.5	22021	0.0544	0.0230	0.1669
5.5	11585	5.5	24484	0.0000	0.0006	0.0007
5.5	11585	5.5	29517	0.0103	0.0190	0.0094
5.5	22021	5.5	22021	0.2337	0.1984	0.0125
5.5	22021	5.5	24484	0.0243	0.0473	0.0657
5.5	22021	5.5	29517	0.0383	0.0079	0.1100
5.5	24484	5.5	24484	0.0168	0.1762	0.0715
5.5	24484	5.5	29517	0.0743	0.0755	0.1595
5.5	29517	5.5	29517	0.1513	0.1494	0.0256
5.5	6453	6.5	8103	0.0029	0.5996	0.2694
5.5	6453	6.5	23176	0.0050	0.0329	0.0961
5.5	6453	6.5	30306	0.0047	0.0052	0.0188
5.5	11585	6.5	8103	0.4630	0.0006	0.3387
5.5	11585	6.5	23176	0.0257	0.0002	0.0835
5.5	11585	6.5	30306	0.0008	0.0043	0.1341
5.5	22021	6.5	8103	0.0348	0.2351	0.0230
5.5	22021	6.5	23176	0.0000	0.0088	0.2982
5.5	22021	6.5	30306	0.0444	0.0500	0.0309
5.5	24484	6.5	8103	0.0003	0.0003	0.0231
5.5	24484	6.5	23176	0.0090	0.0369	0.0528
5.5	24484	6.5	30306	0.0008	0.0017	0.0019
5.5	29517	6.5	8103	0.0130	0.0197	0.0117
5.5	29517	6.5	23176	0.2374	0.1836	0.0213
5.5	29517	6.5	30306	0.0095	0.0170	0.0469
5.5	6453	7.5	149	0.8901	0.0980	0.6502
5.5	6453	7.5	16172	0.0182	0.1679	0.0017
5.5	6453	7.5	27614	0.0033	0.0385	0.1925
5.5	6453	7.5	29135	0.0001	0.0007	0.0241
5.5	11585	7.5	149	0.1648	0.6136	0.0843
5.5	11585	7.5	16172	0.1076	0.0186	0.0350
5.5	11585	7.5	27614	0.0089	0.0009	0.0980
5.5	11585	7.5	29135	0.0006	0.0077	0.0133
5.5	22021	7.5	149	0.0003	0.0475	0.0329
5.5	22021	7.5	16172	0.3985	0.0906	0.5393
5.5	22021	7.5	27614	0.0090	0.0091	0.3269
5.5	22021	7.5	29135	0.0070	0.0003	0.0132
5.5	24484	7.5	149	0.0004	0.0073	0.0929

Appendix XVIII (Continued)

J1	LEVEL 1	J2	LEVEL 2	(U2)2	(U4)2	(U6)2
5.5	24484	7.5	16172	0.2706	0.1031	0.0852
5.5	24484	7.5	27614	0.1404	0.0000	0.0869
5.5	24484	7.5	29135	0.0046	0.4525	0.0038
5.5	29517	7.5	149	0.0398	0.0121	0.0005
5.5	29517	7.5	16172	0.2726	0.0769	0.0013
5.5	29517	7.5	27614	0.0182	0.0445	0.0000
5.5	29517	7.5	29135	0.0486	0.0028	0.0005
5.5	6453	8.5	20869	0.0	0.0000	0.0997
5.5	6453	8.5	31430	0.0	0.0135	0.0143
5.5	11585	8.5	20869	0.0	0.0675	0.0379
5.5	11585	8.5	31430	0.0	0.0008	0.0711
5.5	22021	8.5	20869	0.0	0.0457	0.2073
5.5	22021	8.5	31430	0.0	0.0006	0.0994
5.5	24484	8.5	20869	0.0	0.0060	0.1644
5.5	24484	8.5	31430	0.0	0.0499	0.0596
5.5	29517	8.5	20869	0.0	0.0060	0.7703
5.5	29517	8.5	31430	0.0	0.0401	0.0138
5.5	6453	9.5	22409	0.0	0.1009	0.3460
5.5	11585	9.5	22409	0.0	0.1578	0.0353
5.5	22021	9.5	22409	0.0	0.3181	0.3561
5.5	24484	9.5	22409	0.0	0.1997	0.0194
5.5	29517	9.5	22409	0.0	0.0079	0.2563
5.5	6453	10.5	22247	0.0	0.0	0.4719
5.5	11585	10.5	22247	0.0	0.0	0.0349
5.5	22021	10.5	22247	0.0	0.0	0.4713
5.5	24484	10.5	22247	0.0	0.0	0.0015
5.5	29517	10.5	22247	0.0	0.0	0.0185
6.5	8103	6.5	8103	0.7054	0.0620	0.1202
6.5	8103	6.5	23176	0.0000	0.0095	0.0037
6.5	8103	6.5	30306	0.0301	0.0092	0.0162
6.5	23176	6.5	23176	0.5747	0.1689	0.1585
6.5	23176	6.5	30306	0.0229	0.0582	0.0266
6.5	30306	6.5	30306	0.0025	0.0482	0.3421
6.5	8103	7.5	149	0.2098	0.3719	0.5062
6.5	8103	7.5	16172	0.0435	0.0518	0.0179
6.5	8103	7.5	27614	0.0079	0.0063	0.0041
6.5	8103	7.5	29135	0.0063	0.0110	0.1993
6.5	23176	7.5	149	0.0616	0.0411	0.0722
6.5	23176	7.5	16172	0.1329	0.0380	0.1584
6.5	23176	7.5	27614	0.0060	0.0136	0.0000
6.5	23176	7.5	29135	0.0599	0.0390	0.7690
6.5	30306	7.5	149	0.0178	0.0405	0.0019
6.5	30306	7.5	16172	0.0535	0.1798	0.4136
6.5	30306	7.5	27614	0.0188	0.0805	0.0674
6.5	30306	7.5	29135	0.2441	0.3776	0.0077
6.5	8103	8.5	20869	0.0135	0.0256	0.0004
6.5	8103	8.5	31430	0.0020	0.0030	0.2047
6.5	23176	8.5	20869	0.1043	0.0208	0.0004
6.5	23176	8.5	31430	0.0379	0.3658	0.1239

Appendix XVIII (Continued)

J1	LEVEL 1	J2	LEVEL 2	(U2)2	(U4)2	(U6)2
6.5	30306	8.5	20869	0.0729	0.1101	0.0666
6.5	30306	8.5	31430	0.0707	0.0592	0.2863
6.5	8103	9.5	22409	0.0	0.0123	0.0009
6.5	23176	9.5	22409	0.0	0.2125	0.0370
6.5	30306	9.5	22409	0.0	0.0374	0.0165
6.5	8103	10.5	22247	0.0	0.0149	0.0161
6.5	23176	10.5	22247	0.0	0.3432	0.3953
6.5	30306	10.5	22247	0.0	0.3684	0.0166
7.5	149	7.5	149	1.1313	0.6129	0.1268
7.5	149	7.5	16172	0.0258	0.0004	0.4320
7.5	149	7.5	27614	0.0143	0.0153	0.0220
7.5	149	7.5	29135	0.0176	0.0000	0.0016
7.5	16172	7.5	16172	0.4526	0.4997	0.7843
7.5	16172	7.5	27614	0.1553	0.0808	0.0717
7.5	16172	7.5	29135	0.0286	0.0249	0.2205
7.5	27614	7.5	27614	0.0322	0.7339	0.0087
7.5	27614	7.5	29135	0.0019	0.0011	0.2030
7.5	29135	7.5	29135	0.0568	0.3375	0.0394
7.5	149	8.5	20869	0.0798	0.0433	0.5011
7.5	149	8.5	31430	0.0037	0.0018	0.0003
7.5	16172	8.5	20869	0.2316	0.0565	0.6154
7.5	16172	8.5	31430	0.0727	0.0068	0.0094
7.5	27614	8.5	20869	0.2409	0.4579	0.4931
7.5	27614	8.5	31430	0.0000	0.0513	0.0539
7.5	29135	8.5	20869	0.0211	0.0005	0.4148
7.5	29135	8.5	31430	0.2617	0.0481	0.0046
7.5	149	9.5	22409	0.0001	0.1379	0.5524
7.5	16172	9.5	22409	0.0234	0.3122	0.6782
7.5	27614	9.5	22409	0.1500	0.0027	0.0543
7.5	29135	9.5	22409	0.1387	0.0500	0.3780
7.5	149	10.5	22247	0.0	0.0819	0.3959
7.5	16172	10.5	22247	0.0	0.2912	0.5403
7.5	27614	10.5	22247	0.0	0.0648	0.0375
7.5	29135	10.5	22247	0.0	0.0020	0.4238
8.5	20869	8.5	20869	0.2068	0.0471	0.0340
8.5	20869	8.5	31430	0.1001	0.0751	1.2286
8.5	31430	8.5	31430	0.0506	0.1440	0.0147
8.5	20869	9.5	22409	0.7411	0.1076	0.0001
8.5	31430	9.5	22409	0.1136	0.3056	0.3811
8.5	20869	10.5	22247	0.0160	1.2116	0.0133
8.5	31430	10.5	22247	0.0016	0.2136	0.0116
9.5	22409	9.5	22409	0.0013	0.0960	0.6205
9.5	22409	10.5	22247	1.1443	0.3491	0.2705
10.5	22247	10.5	22247	0.8371	0.7430	0.4143

Appendix XIX

Matrix Elements of (Uλ)2 for Es^{3+}:$LaCl_3$ with Ground State, J1 = 8.0

J2	LEVEL	(U2)2	(U4)2	(U6)2
5.0	9701	0.0	0.0860	0.1080
7.0	11039	0.0188	0.1088	1.2718
2.0	11963	0.0	0.0	0.0176
6.0	13009	0.5686	0.4638	1.0705
4.0	16046	0.0	0.3641	0.4149
4.0	17649	0.0	0.1831	0.0456
5.0	18754	0.0	0.0812	0.5866
8.0	19904	0.0779	0.1303	0.6694
6.0	19933	1.0614	0.4981	0.0213
2.0	20448	0.0	0.0	0.4132
4.0	20796	0.0	0.0477	0.1903
3.0	21861	0.0	0.0	0.3962
1.0	22596	0.0	0.0	0.0
5.0	23232	0.0	0.7464	0.0003
2.0	25131	0.0	0.0	0.0098

Appendix XIX (Continued)
Matrix Elements of (Uλ)2 for Es^{3+}:$LaCl_3$ (to 26000 cm^{-1})

J1	LEVEL 1	J2	LEVEL 2	(U2)2	(U4)2	(U6)2
1.0	22596	1.0	22596	0.0325	0.0	0.0
1.0	22596	2.0	11963	0.0453	0.0	0.0
1.0	22596	2.0	20448	0.0139	0.0	0.0
1.0	22596	2.0	25131	0.0169	0.0	0.0
1.0	22596	3.0	21861	0.0000	0.0421	0.0
1.0	22596	4.0	16046	0.0	0.0914	0.0
1.0	22596	4.0	17649	0.0	0.0486	0.0
1.0	22596	4.0	20796	0.0	0.0336	0.0
1.0	22596	5.0	9701	0.0	0.0235	0.2745
1.0	22596	5.0	18754	0.0	0.0660	0.0191
1.0	22596	5.0	23232	0.0	0.0255	0.0197
1.0	22596	6.0	13009	0.0	0.0	0.0208
1.0	22596	6.0	19933	0.0	0.0	0.1139
1.0	22596	7.0	11039	0.0	0.0	0.0285
2.0	11963	2.0	11963	0.0007	0.0049	0.0
2.0	11963	2.0	20448	0.0502	0.0049	0.0
2.0	11963	2.0	25131	0.2541	0.0245	0.0
2.0	20448	2.0	20448	0.0106	0.0063	0.0
2.0	20448	2.0	25131	0.0252	0.0737	0.0
2.0	25131	2.0	25131	0.0057	0.0056	0.0
2.0	11963	3.0	21861	0.0098	0.0003	0.0
2.0	20448	3.0	21861	0.0088	0.0009	0.0
2.0	25131	3.0	21861	0.0197	0.1131	0.0
2.0	11963	4.0	16046	0.0722	0.3099	0.0132
2.0	11963	4.0	17649	0.0637	0.2385	0.1769
2.0	11963	4.0	20796	0.0430	0.1093	0.1871
2.0	20448	4.0	16046	0.0505	0.0005	0.0068
2.0	20448	4.0	17649	0.2242	0.2990	0.0295
2.0	20448	4.0	20796	0.1759	0.0325	0.0157
2.0	25131	4.0	16046	0.0383	0.0492	0.0067
2.0	25131	4.0	17649	0.3763	0.0052	0.0588
2.0	25131	4.0	20796	0.0025	0.0622	0.0020
2.0	11963	5.0	9701	0.0	0.0226	0.0176
2.0	11963	5.0	18754	0.0	0.0013	0.0001
2.0	11963	5.0	23232	0.0	0.0049	0.0001
2.0	20448	5.0	9701	0.0	0.0206	0.0089
2.0	20448	5.0	18754	0.0	0.0333	0.2425
2.0	20448	5.0	23232	0.0	0.2815	0.0667
2.0	25131	5.0	9701	0.0	0.2948	0.2312
2.0	25131	5.0	18754	0.0	0.1421	0.0033
2.0	25131	5.0	23232	0.0	0.0246	0.0777
2.0	11963	6.0	13009	0.0	0.1671	0.0366
2.0	11963	6.0	19933	0.0	0.0583	0.0010
2.0	20448	6.0	13009	0.0	0.0063	0.0409
2.0	20448	6.0	19933	0.0	0.1590	0.1104
2.0	25131	6.0	13009	0.0	0.0035	0.0254

Appendix XIX (Continued)

J1	LEVEL 1	J2	LEVEL 2	(U2)2	(U4)2	(U6)2
2.0	25131	6.0	19933	0.0	0.0200	0.0079
2.0	11963	7.0	11039	0.0	0.0	0.2299
2.0	20448	7.0	11039	0.0	0.0	0.0101
2.0	25131	7.0	11039	0.0	0.0	0.0262
2.0	11963	8.0	245	0.0	0.0	0.0176
2.0	11963	8.0	19904	0.0	0.0	0.0092
2.0	20448	8.0	245	0.0	0.0	0.4132
2.0	20448	8.0	19904	0.0	0.0	0.0161
2.0	25131	8.0	245	0.0	0.0	0.0098
2.0	25131	8.0	19904	0.0	0.0	0.0136
3.0	21861	3.0	21861	0.0659	0.0575	0.0011
3.0	21861	4.0	16046	0.0015	0.0111	0.0149
3.0	21861	4.0	17649	0.0008	0.0114	0.1275
3.0	21861	4.0	20796	0.1525	0.1368	0.0011
3.0	21861	5.0	9701	0.0786	0.0035	0.0119
3.0	21861	5.0	18754	0.0127	0.2660	0.0696
3.0	21861	5.0	23232	0.2339	0.0685	0.0308
3.0	21861	6.0	13009	0.0	0.1272	0.2334
3.0	21861	6.0	19933	0.0	0.0045	0.0124
3.0	21861	7.0	11039	0.0	0.2246	0.1284
3.0	21861	8.0	245	0.0	0.0	0.3962
3.0	21861	8.0	19904	0.0	0.0	0.0070
4.0	16046	4.0	16046	0.6479	0.1000	0.0150
4.0	16046	4.0	17649	0.0605	0.0782	0.0853
4.0	16046	4.0	20796	0.1236	0.0300	0.2085
4.0	17649	4.0	17649	0.5763	0.1925	0.0050
4.0	17649	4.0	20796	0.0854	0.0597	0.1995
4.0	20796	4.0	20796	0.1619	0.0206	0.0186
4.0	16046	5.0	9701	0.5234	0.0337	0.3047
4.0	16046	5.0	18754	0.0001	0.0045	0.1945
4.0	16046	5.0	23232	0.1758	0.0004	0.1726
4.0	17649	5.0	9701	0.1771	0.0149	0.1080
4.0	17649	5.0	18754	0.0028	0.0070	0.2995
4.0	17649	5.0	23232	0.0117	0.0005	0.0586
4.0	20796	5.0	9701	0.0005	0.0779	0.1609
4.0	20796	5.0	18754	0.2945	0.2402	0.0021
4.0	20796	5.0	23232	0.1205	0.3149	0.0133
4.0	16046	6.0	13009	0.4199	0.0380	0.2756
4.0	16046	6.0	19933	0.0508	0.1387	0.0568
4.0	17649	6.0	13009	0.3557	0.0023	0.1642
4.0	17649	6.0	19933	0.0442	0.0190	0.0055
4.0	20796	6.0	13009	0.2204	0.0358	0.0642
4.0	20796	6.0	19933	0.0526	0.2865	0.1473
4.0	16046	7.0	11039	0.0	0.2012	0.0474
4.0	17649	7.0	11039	0.0	0.1046	0.1136
4.0	20796	7.0	11039	0.0	0.0365	0.0044
4.0	16046	8.0	245	0.0	0.3641	0.4149
4.0	16046	8.0	19904	0.0	0.1419	0.0106
4.0	17649	8.0	245	0.0	0.1831	0.0456

Appendix XIX (Continued)

J1	LEVEL 1	J2	LEVEL 2	(U2)2	(U4)2	(U6)2
4.0	17649	8.0	19904	0.0	0.0845	0.0768
4.0	20796	8.0	245	0.0	0.0477	0.1903
4.0	20796	8.0	19904	0.0	0.1043	0.0018
5.0	9701	5.0	9701	0.0006	0.0134	0.0554
5.0	9701	5.0	18754	0.0130	0.0945	0.0106
5.0	9701	5.0	23232	0.1359	0.0007	0.0007
5.0	18754	5.0	18754	0.0334	0.2345	0.1568
5.0	18754	5.0	23232	0.2718	0.1324	0.0904
5.0	23232	5.0	23232	0.2801	0.0262	0.0597
5.0	9701	6.0	13009	0.5536	0.9493	0.0118
5.0	9701	6.0	19933	0.3340	0.0747	0.0372
5.0	18754	6.0	13009	0.0076	0.0029	0.4760
5.0	18754	6.0	19933	0.2949	0.0442	0.1720
5.0	23232	6.0	13009	0.0076	0.2318	0.0133
5.0	23232	6.0	19933	0.4101	0.0109	0.4000
5.0	9701	7.0	11039	0.0420	0.1328	0.5940
5.0	18754	7.0	11039	0.0529	0.2574	0.0986
5.0	23232	7.0	11039	0.7508	0.0299	0.4000
5.0	9701	8.0	245	0.0	0.0860	0.1080
5.0	9701	8.0	19904	0.0	0.0539	0.0896
5.0	18754	8.0	245	0.0	0.0812	0.5866
5.0	18754	8.0	19904	0.0	0.0061	0.0157
5.0	23232	8.0	245	0.0	0.7464	0.0003
5.0	23232	8.0	19904	0.0	0.0832	0.0000
6.0	13009	6.0	13009	0.1169	0.1134	0.0621
6.0	13009	6.0	19933	0.0126	0.0703	0.1063
6.0	19933	6.0	19933	0.0024	0.6112	0.0119
6.0	13009	7.0	11039	0.0009	0.0023	0.1164
6.0	19933	7.0	11039	0.2019	0.5941	0.7370
6.0	13009	8.0	245	0.5686	0.4638	1.0705
6.0	13009	8.0	19904	0.0302	0.0471	0.2917
6.0	19933	8.0	245	1.0614	0.4981	0.0213
6.0	19933	8.0	19904	0.0607	0.0233	0.0116
7.0	11039	7.0	11039	0.1147	0.0912	0.0136
7.0	11039	8.0	245	0.0188	0.1088	1.2718
7.0	11039	8.0	19904	0.0128	0.0154	0.0903
8.0	245	8.0	245	0.1054	0.1688	0.8498
8.0	245	8.0	19904	0.0779	0.1303	0.6694
8.0	19904	8.0	19904	0.0500	0.0580	0.2700

Appendix XX
Matrix Elements of (Uλ)2 for Fm^{3+}:$LaCl_3$ with Ground State, J1 = 7.5

J2	LEVEL	(U2)2	(U4)2	(U6)2
4.5	8425	0.0	0.6994	0.1056
5.5	10037	0.7517	0.2355	0.1411
1.5	12172	0.0	0.0	0.0825
6.5	13125	0.0188	0.1119	1.3271
2.5	18565	0.0	0.0	0.1230
4.5	19854	0.0	0.1868	0.3352
5.5	21365	0.7534	0.4860	0.5882
3.5	21672	0.0	0.0273	0.7507
1.5	23018	0.0	0.0	0.2491
3.5	24357	0.0	0.3544	0.0549

Appendix XX (Continued)
Matrix Elements of (Uλ)2 for Fm^{3+}:$LaCl_3$ (to 25000 cm^{-1})

J1	LEVEL 1	J2	LEVEL 2	(U2)2	(U4)2	(U6)2
1.5	12172	1.5	12172	0.2515	0.0	0.0
1.5	12172	1.5	23018	0.0325	0.0	0.0
1.5	23018	1.5	23018	0.0273	0.0	0.0
1.5	12172	2.5	18565	0.1212	0.0248	0.0
1.5	23018	2.5	18565	0.0033	0.0322	0.0
1.5	12172	3.5	21672	0.0191	0.0043	0.0
1.5	12172	3.5	24357	0.2673	0.3373	0.0
1.5	23018	3.5	21672	0.0010	0.0194	0.0
1.5	23018	3.5	24357	0.0081	0.0317	0.0
1.5	12172	4.5	8425	0.0	0.1954	0.1337
1.5	12172	4.5	19854	0.0	0.1168	0.1377
1.5	23018	4.5	8425	0.0	0.0978	0.0419
1.5	23018	4.5	19854	0.0	0.0324	0.0228
1.5	12172	5.5	10037	0.0	0.1438	0.0000
1.5	12172	5.5	21365	0.0	0.0826	0.0230
1.5	23018	5.5	10037	0.0	0.1166	0.2373
1.5	23018	5.5	21365	0.0	0.0046	0.0962
1.5	12172	6.5	13125	0.0	0.0	0.2244
1.5	23018	6.5	13125	0.0	0.0	0.0040
1.5	12172	7.5	341	0.0	0.0	0.0825
1.5	23018	7.5	341	0.0	0.0	0.2491
2.5	18565	2.5	18565	0.2976	0.1115	0.0
2.5	18565	3.5	21672	0.3546	0.0521	0.1074
2.5	18565	3.5	24357	0.8345	0.0307	0.0007
2.5	18565	4.5	8425	0.1545	0.0069	0.0027
2.5	18565	4.5	19854	0.0106	0.0750	0.2514
2.5	18565	5.5	10037	0.0	0.0515	0.2002
2.5	18565	5.5	21365	0.0	0.0246	0.0896
2.5	18565	6.5	13125	0.0	0.2029	0.1370
2.5	18565	7.5	341	0.0	0.0	0.1230
3.5	21672	3.5	21672	0.1008	0.0440	0.0792
3.5	21672	3.5	24357	0.1046	0.0000	0.0021
3.5	24357	3.5	24357	0.0007	0.0000	0.0633
3.5	21672	4.5	8425	0.0067	0.3093	0.0799
3.5	21672	4.5	19854	0.0003	0.0000	0.0827
3.5	24357	4.5	8425	0.2964	0.5183	0.3070
3.5	24357	4.5	19854	0.0285	0.0592	0.0754
3.5	21672	5.5	10037	0.3687	0.4449	0.0009
3.5	21672	5.5	21365	0.0825	0.0136	0.2602
3.5	24357	5.5	10037	0.6327	0.3587	0.4002
3.5	24357	5.5	21365	0.0785	0.0207	0.0785
3.5	21672	6.5	13125	0.0	0.3205	0.0001
3.5	24357	6.5	13125	0.0	0.1207	0.0059
3.5	21672	7.5	341	0.0	0.0273	0.7507
3.5	24357	7.5	341	0.0	0.3544	0.0549
4.5	8425	4.5	8425	0.2110	0.0308	0.1642

Appendix XX (Continued)

J1	LEVEL 1	J2	LEVEL 2	(U2)2	(U4)2	(U6)2
4.5	8425	4.5	19854	0.0877	0.0017	0.4323
4.5	19854	4.5	19854	0.0282	0.0309	0.0011
4.5	8425	5.5	10037	0.5621	0.0009	0.2812
4.5	8425	5.5	21365	0.2690	0.0549	0.0185
4.5	19854	5.5	10037	0.0997	0.0282	0.2912
4.5	19854	5.5	21365	0.1146	0.0050	0.3095
4.5	8425	6.5	13125	0.0151	0.0666	0.5205
4.5	19854	6.5	13125	0.0426	0.0520	0.0036
4.5	8425	7.5	341	0.0	0.6994	0.1056
4.5	19854	7.5	341	0.0	0.1868	0.3352
5.5	10037	5.5	10037	0.0010	0.3642	0.0016
5.5	10037	5.5	21365	0.0070	0.1872	0.0124
5.5	21365	5.5	21365	0.0578	0.0007	0.3265
5.5	10037	6.5	13125	0.0667	0.2726	0.3843
5.5	21365	6.5	13125	0.0244	0.0195	0.2252
5.5	10037	7.5	341	0.7517	0.2355	0.1411
5.5	21365	7.5	341	0.7534	0.4860	0.5882
6.5	13125	6.5	13125	0.1905	0.1736	0.2099
6.5	13125	7.5	341	0.0188	0.1119	1.3271
7.5	341	7.5	341	0.3232	0.4214	1.5092

Appendix XXI
Matrix Elements of (Uλ)2 for Md^{3+}:$LaCl_3$ with Ground State, J1 = 6.0

J2	LEVEL	(U2)2	(U4)2	(U6)2
4.0	3500	0.5828	0.8296	0.2151
2.0	12075	0.0	0.0809	0.1467
5.0	15487	0.1048	0.2259	0.6233
4.0	19088	0.2177	0.0812	0.6367
3.0	19350	0.0	0.3089	0.8214
0.0	27708	0.0	0.0	0.0873
2.0	27879	0.0	0.4264	0.2614

Appendix XXI (Continued)
Matrix Elements of (Uλ)2 for Md^{3+}:$LaCl_3$ (to 30000 cm^{-1})

J1	LEVEL 1	J2	LEVEL 2	(U2)2	(U4)2	(U6)2
0.0	27708	2.0	12075	0.4730	0.0	0.0
0.0	27708	2.0	27879	0.0006	0.0	0.0
0.0	27708	4.0	3500	0.0	0.3191	0.0
0.0	27708	4.0	19088	0.0	0.0408	0.0
0.0	27708	6.0	331	0.0	0.0	0.0873
2.0	12075	2.0	12075	0.3612	0.3690	0.0
2.0	12075	2.0	27879	0.0301	0.0311	0.0
2.0	27879	2.0	27879	0.0626	0.4202	0.0
2.0	12075	3.0	19350	0.0188	0.1339	0.0
2.0	27879	3.0	19350	0.2521	0.0809	0.0
2.0	12075	4.0	3500	0.6883	0.0020	0.0699
2.0	12075	4.0	19088	0.1337	0.0860	0.0011
2.0	27879	4.0	3500	0.3131	0.1815	0.0002
2.0	27879	4.0	19088	0.4386	0.0134	0.2088
2.0	12075	5.0	15487	0.0	0.2441	0.3758
2.0	27879	5.0	15487	0.0	0.0009	0.0734
2.0	12075	6.0	331	0.0	0.0809	0.1467
2.0	27879	6.0	331	0.0	0.4264	0.2614
3.0	19350	3.0	19350	0.0625	0.0030	0.0625
3.0	19350	4.0	3500	0.0051	0.0050	0.1211
3.0	19350	4.0	19088	0.0609	0.2496	0.1454
3.0	19350	5.0	15487	0.6285	0.3467	0.0
3.0	19350	6.0	331	0.0	0.3089	0.8214
4.0	3500	4.0	3500	0.0156	0.3815	0.2446
4.0	3500	4.0	19088	0.1007	0.1630	0.3667
4.0	19088	4.0	19088	0.1070	0 2533	0.0914
4.0	3500	5.0	15487	0.0772	0.1594	0.8258
4.0	19088	5.0	15487	0.0023	0.4006	0.0047
4.0	3500	6.0	331	0.5828	0.8296	0.2151
4.0	19088	6.0	331	0.2177	0.0812	0.6367
5.0	15487	5.0	15487	0.9192	0.3668	0.1214
5.0	15487	6.0	331	0.1048	0.2259	0.6233
6.0	331	6.0	331	1.3108	0.6110	0.7250

Appendix XXII.

Large Magnetic Dipole (MD) Matrix Elements for

Transitions in $An^{3+}:LaCl_3/AnCl_3$[a]

U^{3+} (to 26000 cm^{-1})

J1	Level 1	J2	Level 2	$(MD)^2$
3.5	13297	4.5	16903	10.08
4.5	300	5.5	4563	16.87
5.5	4563	6.5	8307	22.75
6.5	8307	7.5	11656	17.02

Np^{3+} (to 27000 cm^{-1})

J1	Level 1	J2	Level 2	$(MD)^2$
3.0	12732	4.0	17600	10.00
4.0	191	5.0	3954	22.29
4.0	15298	5.0	18593	12.66
4.0	17600	5.0	21077	14.20
5.0	3954	6.0	7231	32.34
6.0	7231	7.0	9958	30.58
7.0	9958	8.0	12315	19.39
8.0	12315	8.0	17764	10.50
8.0	17764	8.0	24476	11.50

Appendix XXII. (cont.)

Pu^{3+} (to 28000 cm^{-1})

J1	Level 1	J2	Level 2	$(MD)^2$
1.5	6745	2.5	6751	13.54
2.5	56.8	3.5	3327	21.10
2.5	6751	3.5	9572	17.74
3.5	3327	4.5	6254	34.44
3.5	9572	4.5	12306	19.18
3.5	18307	4.5	21797	11.10
4.5	6254	5.5	8783	39.28
4.5	12306	5.5	14853	13.41
4.5	17471	5.5	24699	10.16
5.5	8783	6.5	10961	34.64
5.5	17714	6.5	23695	12.16
5.5	24699	6.5	25255	12.55
6.5	10961	7.5	12515	19.52
6.5	17678	7.5	22451	17.03
7.5	12515	7.5	16449	18.37
7.5	16449	7.5	24060	10.23
7.5	16449	8.5	20775	17.69
7.5	22451	8.5	25700	14.11
8.5	20775	9.5	23819	23.53
9.5	23819	10.5	25617	15.48

Appendix XXII. (cont.)

Am^{3+} (to 37000 cm^{-1})

J1	Level 1	J2	Level 2	$(MD)^2$
1	2760	2	5350	17.76
2	5350	3	7590	25.52
3	7590	4	9544	29.06
3	22649	4	23640	12.19
3	25281	4	26552	10.27
3	29265	4	29928	11.44
4	9544	5	11191	26.65
4	23640	5	23349	13.65
4	26552	5	27608	11.04
4	34067	5	34753	12.13
5	23349	5	29654	10.20
5	11191	6	12329	16.60
5	29905	6	32844	11.76
5	33487	6	32254	10.72
6	19602	6	24758	22.86
6	19602	7	24047	19.69
6	24758	7	28896	13.65
6	32254	7	32922	10.07
6	32844	7	36295	21.17
7	24047	8	26782	31.67
7	28896	8	32715	11.51

Appendix XXII. (cont.)

Am^{3+} (to 37000 cm^{-1})

J1	Level 1	J2	Level 2	$(MD)^2$
7	32922	8	33422	15.44
8	26782	9	28441	34.05
9	28441	10	28399	21.91
10	28399	10	35371	14.33

Cm^{3+} (to 40000 cm^{-1})

J1	Level 1	J2	Level 2	$(MD)^2$
1.5	38777	2.5	39036	12.28
3.5	16953	3.5	21777	15.02
3.5	21777	3.5	30173	11.40
3.5	21777	4.5	22949	10.12
3.5	35520	4.5	32073	10.85
4.5	22949	4.5	25933	15.43
4.5	22949	5.5	25165	26.46
4.5	32073	5.5	31043	14.08
5.5	25165	6.5	26085	40.12
5.5	31043	6.5	34205	14.63
6.5	26085	7.5	26483	37.81
7.5	26483	8.5	25038	25.83

Appendix XXII. (cont.)

Bk^{3+} (to 28000 cm^{-1})

J1	Level 1	J2	Level 2	$(MD)^2$
1.0	9648	2.0	7968	16.67
2.0	7968	3.0	7734	20.63
3.0	7734	4.0	4566	21.47
4.0	4566	5.0	5156	17.05
5.0	5156	6.0	182	17.37
5.0	21020	6.0	15708	10.60
6.0	15708	6.0	23863	16.32
6.0	23863	7.0	26858	15.96
7.0	21036	7.0	26858	11.40
7.0	21036	8.0	23129	14.61
8.0	23129	9.0	23714	19.84
9.0	23714	10.01	21232	18.96

Cf^{3+} (to 32000 cm^{-1})

J1	Level 1	J2	Level 2	$(MD)^2$
3.5	13233	4.5	6648	13.20
3.5	14522	4.5	12866	20.35
4.5	12866	5.5	6453	17.19
4.5	21838	5.5	11585	12.26

Appendix XXII. (cont.)

Cf^{3+} (to 32000 cm^{-1})

J1	Level 1	J2	Level 2	$(MD)^2$
5.5	11585	6.5	8103	19.12
5.5	22021	6.5	8103	12.23
6.5	8103	7.5	149	23.21
7.5	16172	7.5	29135	11.61
7.5	27614	8.5	31430	10.16

Es^{3+} (to 26000 cm^{-1})

J1	Level 1	J2	Level 2	$(MD)^2$
5.0	18754	6.0	13009	14.16
6.0	13009	7.0	11039	14.38
6.0	19933	7.0	11039	11.82
7.0	11039	8.0	245	22.43

Fm^{3+} (to 25000 cm^{-1})

J1	Level 1	J2	Level 2	$(MD)^2$
5.5	21365	6.5	13125	11.64
6.5	13125	7.5	341	17.89

Appendix XXII. (cont.)

Md^{3+} (to 30000 cm^{-1})

J1	Level 1	J2	Level 2	$(MD)^2$
5.0	15487	6.0	331	10.54

[a]See eqn. (4).