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The IAEA Photonuclear Data Co-ordinated Research Programme CDFE Activities

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Progress Report
to the 3-rd Research Co-ordination Meeting (25 - 29 October 1999, JAERI, Tokai, Japan)
of the IAEA Co-ordinated Research Programme on Compilation and Evaluation of Photonuclear Data for Applications

The following works have been carried out by the CDFE in accordance to the scientific CRP Scope and Programme Goals /1/ and the corresponding CDFE /2/ tasks and the results have been obtained in 1998 - 1999 period of time.

Atlas of Photonuclear Reaction Cross Sections. The Atlas of Giant Dipole Resonances (GDR) prepared by the MSU INP CDFE for previous CRP meeting /3/ has been added and improved and published as the IAEA NDS Technical document /4/. The Atlas includes 1317 entries described the GDR parameters and 846 cross sections in graphical form of various photonuclear reactions produced using the international EXFOR nuclear reaction data library. The data for almost all more than 400 various photoneutron cross section entries from well known Atlas of Photoneutron Cross Sections Obtained with Monoenergetic Photons /5/ are also included. All data under duscussion are presented upon the CDFE Web-site (**http:\\depni.npi.msu.su**

Index of Photonuclear Data. The complete photonuclear data Index for period of time 1955 - 1996 has been produced on the base of two CDFE /6/ and JAERI /7/ indexes with addition of the appropriate CDFE data file for 1996 /8/. The CDFE Photonuclear Data Informational files containing the data included into the indexes "PHOTONUCLEAR DATA - 1997" and "PHOTONUCLEAR DATA - 1998" have been prepared for publishing and including into the complete Index put upon the CDFE Web-site. The complete Index has been put upon the CDFE Web-site using hypertext presentation.

New EXFOR TRANSes of Photonuclear Data. 5 new CDFE EXFOR TRANSes have been produced and transmitted to the IAEA NDS.

TRANS	1-st ENTRY's number	Last ENTRY's Number	Amount of ENTRYs	Amount of DATA TABLES
M023	M0533	M0536	4	9
M025	M0537	M0550	14	72
M026	M0551	M0565	15	61
M027	M0566	M0580	15	76
M028	M0581	M0595	15	81
			Total: 63	**Total: 299**

In accordance with the Individual CDFE tasks specified in /2/ the several photoabsorption cross sections for Fe. Al, and Cu have been compiled and included into the new CDFE EXFOR TRANSes :

REACTION	EXFOR SUBENT number
(13-AL-27(G,ABS),,SIG)	M0590 4
(13-AL-27(G,XN),,SIG,,BRS,EXP)	M0538 2
(13-AL-27(G,XN),,SIG,,BRS,EXP)	M0539 2
(26-FE-0(G,ABS),,SIG,,BRS,EXP)	M0540 2
(29-CU-0(G,ABS),,SIG)	M0590 5
(29-CU-0(G,XN),,SIG,,BRS,EXP)	M0537 2
(29-CU-0(G,XN),UNW,SIG,,BRS,EXP)	M0537 5
(29-CU-0(G,XN),,SIG,,BRS,EXP)	M0541 6
(29-CU-0(G,XN),,SIG,,,EXP)	M0542 2

New EXFOR TRANS of Retransmitted Photonuclear Data. CDFE TRANS M024 included pending retransmission of the number of ENTRYs from the CDFE old TRANSes M011 - M014 (TRANSes M0003 – M0340) has been produced and transmitted to the IAEA NDS. The corrections and modifications (60 DATA TABLES from 246 of 29 ENTRYs) have been done in accordance with the IAEA NDS (Dr. O.Schwerer) remarks and comments specified in the Memos CP-D/224 and CP-D/297.

EPNDL–Evaluated PhotoNuclear Data Library. All published data for $^{nat.,20}$Ne(γ,Xn) and ^{20,22}Ne(γ,Xp) reactions /9 – 11/ have been analyzed and used for evaluation /12 -14/ of pure one-neutron and one-proton reactrion cross sections for both isotopes and the ^{20}Ne(γ,np) ^{18}F reaction cross section. The data for reactions thresholds and appropriate subtraction procedures have been used. The evaluated cross sections for ^{20,22}Ne have been included into the preliminary version of the EPNDL3.

Photoabsorption Reaction Cross Sections Data Collection for Future Evaluations. The photoabsorption (or total photoneutron (γ,Xn) or (γ,Sn)) reaction cross section data collection for several highest priority elements (Be, Al, Fe, Ni, Cu, W, Pb) has been produced (about 70 data sets) for future evaluations using the available international EXFOR library and the Atlas /4/ data.

Handbook on Photonuclear Data. The revised CDFE contributions to the IAEA Handbook on Photonuclear Data specified in /2/ have been prepared.

The following handbook parts have been corrected and improved:

- Part 3.2. "Compiled Data";
- Part 5.1. "Evaluations Based on Experimental Data";
- Handbook Annex (the TEX version of the improved Table "Giant Dipole Resonance Parameters" of the Atlas of Photonuclear Reaction Cross Sections /4/).

References.

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2. Ed. by ***P.Oblozinsky***. Summary Report of the 2-nd Research Co-ordination Meeting on Compilation and Evaluation of Photonuclear Data for Applications (23 - 26 June 1998, Los Alamos, USA). INDC(NDS)-384, IAEA NDS, Vienna, Austria, 1998.

3. ***V.V.Varlamov, B.S.Ishkhanov, M.E.Stepanov***. Atlas of Various Photonuclear Reaction Cross Sections and Systematics of the Main Giant Dopole Resonance Parameters. Ed. by ***P.Oblozinsky***. Summary Report of the 2-nd Research Co-ordination Meeting on Compilation and Evaluation of Photonuclear Data for Applications (23 - 26 June 1998, Los Alamos, USA). INDC(NDS)-384, IAEA NDS, Vienna, Austria, 1998, p. 41.

4. ***A.V.Varlamov, V.V.Varlamov, D.S.Rudenko, M.E.Stepanov***. Atlas of Giant Dipole Resonances. Parameters and Graphs of Photonuclear Reaction Cross Sections. INDC(NDS)-394, IAEA NDS, Vienna, Austria, 1999.

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6. ***V.V.Varlamov, V.V.Sapunenko, M.E.Stepanov***. Photonuclear Data Index 1976 - 1995. Izdatel'stvo Moskovskogo Universiteta, Moscow, 1996.

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13. ***V.V.Varlamov, M.E.Stepanov.*** The giant dipole resonance decay main channels analysis and photoneutron and photoproton reaction cross sections evaluation for ^{20,22}Ne. MSU INP Preprint -99-40/598, Moscow, 1999.

14. ***V.V.Varlamov, M.E.Stepanov.*** The Features of ^{20,22}Ne Giant Dipole Resonance Decay Through Neutron and Proton Channels Investigation. Izvestiya RAN, Seriya Fizicheskaya, 63, N2 1999 (in press).