

Supplementary material to: *“The Met Office Unified Model Global Atmosphere 6.0/6.1 and JULES Global Land 6.0/6.1 configurations”*, submitted to Geosci. Model Dev.

David Walters et al.

Met Office, FitzRoy Road, Exeter, EX1 3PB, UK

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1 Introduction

This supplementary material to the main paper is designed to help users of GA6.0 and G6.0 in configuring their systems to correctly implement the new configurations.

2 GA6.0 settings that vary with global horizontal resolution

Table 1 lists the Unified Model (UM) settings (as set in the Rose suite applications - see the Rose documentation at <http://metomi.github.io/rose/doc/rose.html>) that should be changed when changing horizontal resolution. The settings listed here are valid for UM code base vn10.3. The resolutions supported span from N96 (≈ 135 km in the mid-latitudes) to N1280 (≈ 10 km in the mid-latitudes).

namelist entry	N96	N216	N320	N400	N512	N768	N1024	N1280
[namelist:nlsizes]								
global_row_length	192	432	640	800	1024	1536	2048	1560
global_rows	144	324	480	600	768	1152	1536	1280
land_field	Use relevant number from land mask file							
[namelist:nlst_mpp]								
extended_halo_size_ew	4	4	4	4	5	5	5	5
extended_halo_size_ns	5	7	7	8	8	8	10	10
[namelist:nlstcgen]								
steps_per_periodim	72	96	120	120	144	192	288	360
[namelist:run_convection]								
w_cape_limit	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.4
[namelist:run_precip]								
niters_mp	10	8	6	5	5	4	3	2

Table 1: GA6.0 settings that vary with global horizontal resolution.

3 GA6.0 settings that vary with vertical resolution

3.1 UM settings to change with level set

Table 2 lists the UM settings (as set in the Rose suite applications) that should be changed when changing vertical resolution. The settings listed here are valid for UM code base vn10.3. Note that as discussed in the main paper, GA6.0 systems should only use either $L85(50_t, 35_s)_{85}$, $L70(50_t, 20_s)_{80}$, or $L63(50_t, 13_s)_{40}$ level sets.

namelist entry	$L85(50_t, 35_s)_{85}$	$L70(50_t, 20_s)_{80}$	$L63(50_t, 13_s)_{40}$
[namelist:domain("All model level STASH domains")]			
levt	85	70	63
[namelist:nlsizes]			
cloud_levels	85	70	63
model_levels	85	70	63
ozone_levels	85	70	63
[namelist:run_cloud]			
rhcrit(18:)	68*0.800	53*0.800	46*0.800
[namelist:run_dyn]			
damp_height	80000.0	80000.0	40000.0
eta_s	0.5	0.5	0.75

Table 2: GA6.0 settings that vary with atmospheric vertical resolution

3.2 Details of vertical level sets

In the vertical, the UM uses the terrain-following height coordinate η , which is normalised to be $\eta = 0$ at the lower boundary, and $\eta = 1$ at a height z_T , the height of the fixed model lid. In between, the height above mean sea level at any given point, z , is defined by

$$z = \begin{cases} \eta z_T + h \left(1 - \frac{\eta}{\eta_I}\right)^2, & 0 \leq \eta \leq \eta_I; \\ \eta z_T, & \eta_I \leq \eta \leq z_T, \end{cases} \quad (1)$$

where h is the height of the model orography above the earth's mean radius and η_I is the level at and above which the levels are flat.

The namelists below detail the level sets used with GA6.0. In these namelists, the variable `z_top_of_model= z_T` (in metres), `eta_theta` is the array of η values for the levels on which the prognostic potential temperature (θ) is held including the surface, `eta_rho` is the array of η values for the levels on which the prognostic density (ρ) is held, and `first_constant_r_rho_level` is the ρ -level at which $\eta = \eta_I$.

Level set L85(50_t,35_s)₈₅

```
&VERTLEVS
  z_top_of_model =      85000.00,
  first_constant_r_rho_level=  51,
  eta_theta=
  0.0000000E+00,  0.2352941E-03,  0.6274510E-03,  0.1176471E-02,  0.1882353E-02,
  0.2745098E-02,  0.3764706E-02,  0.4941176E-02,  0.6274510E-02,  0.7764705E-02,
  0.9411764E-02,  0.1121569E-01,  0.1317647E-01,  0.1529412E-01,  0.1756863E-01,
  0.2000000E-01,  0.2258823E-01,  0.2533333E-01,  0.2823529E-01,  0.3129411E-01,
  0.3450980E-01,  0.3788235E-01,  0.4141176E-01,  0.4509804E-01,  0.4894118E-01,
  0.5294117E-01,  0.5709804E-01,  0.6141176E-01,  0.6588235E-01,  0.7050980E-01,
  0.7529411E-01,  0.8023529E-01,  0.8533333E-01,  0.9058823E-01,  0.9600001E-01,
  0.1015687E+00,  0.1072942E+00,  0.1131767E+00,  0.1192161E+00,  0.1254127E+00,
  0.1317666E+00,  0.1382781E+00,  0.1449476E+00,  0.1517757E+00,  0.1587633E+00,
  0.1659115E+00,  0.1732221E+00,  0.1806969E+00,  0.1883390E+00,  0.1961518E+00,
  0.2041400E+00,  0.2123093E+00,  0.2206671E+00,  0.2292222E+00,  0.2379856E+00,
  0.2469709E+00,  0.2561942E+00,  0.2656752E+00,  0.2754372E+00,  0.2855080E+00,
  0.2959203E+00,  0.3067128E+00,  0.3179307E+00,  0.3296266E+00,  0.3418615E+00,
  0.3547061E+00,  0.3682416E+00,  0.3825613E+00,  0.3977717E+00,  0.4139944E+00,
  0.4313675E+00,  0.4500474E+00,  0.4702109E+00,  0.4920571E+00,  0.5158098E+00,
  0.5417201E+00,  0.5700686E+00,  0.6011688E+00,  0.6353697E+00,  0.6730590E+00,
  0.7146671E+00,  0.7606701E+00,  0.8115944E+00,  0.8680208E+00,  0.9305884E+00,
  0.1000000E+01,
  eta_rho=
  0.1176471E-03,  0.4313726E-03,  0.9019608E-03,  0.1529412E-02,  0.2313725E-02,
  0.3254902E-02,  0.4352941E-02,  0.5607843E-02,  0.7019607E-02,  0.8588235E-02,
  0.1031373E-01,  0.1219608E-01,  0.1423529E-01,  0.1643137E-01,  0.1878431E-01,
  0.2129412E-01,  0.2396078E-01,  0.2678431E-01,  0.2976470E-01,  0.3290196E-01,
  0.3619608E-01,  0.3964706E-01,  0.4325490E-01,  0.4701960E-01,  0.5094118E-01,
  0.5501961E-01,  0.5925490E-01,  0.6364705E-01,  0.6819607E-01,  0.7290196E-01,
  0.7776470E-01,  0.8278431E-01,  0.8796078E-01,  0.9329412E-01,  0.9878433E-01,
  0.1044314E+00,  0.1102354E+00,  0.1161964E+00,  0.1223144E+00,  0.1285897E+00,
  0.1350224E+00,  0.1416128E+00,  0.1483616E+00,  0.1552695E+00,  0.1623374E+00,
  0.1695668E+00,  0.1769595E+00,  0.1845180E+00,  0.1922454E+00,  0.2001459E+00,
  0.2082247E+00,  0.2164882E+00,  0.2249446E+00,  0.2336039E+00,  0.2424783E+00,
  0.2515826E+00,  0.2609347E+00,  0.2705562E+00,  0.2804726E+00,  0.2907141E+00,
  0.3013166E+00,  0.3123218E+00,  0.3237787E+00,  0.3357441E+00,  0.3482838E+00,
  0.3614739E+00,  0.3754014E+00,  0.3901665E+00,  0.4058831E+00,  0.4226810E+00,
  0.4407075E+00,  0.4601292E+00,  0.4811340E+00,  0.5039334E+00,  0.5287649E+00,
  0.5558944E+00,  0.5856187E+00,  0.6182693E+00,  0.6542144E+00,  0.6938630E+00,
  0.7376686E+00,  0.7861323E+00,  0.8398075E+00,  0.8993046E+00,  0.9652942E+00,
```

Level set L70(50_t,20_s)₈₀

&VERTLEVS

```
z_top_of_model = 80000.0,
first_constant_r_rho_level= 50,
eta_theta=
.0000000, .0002500, .0006667, .0012500, .0020000,
.0029167, .0040000, .0052500, .0066667, .0082500,
.0100000, .0119167, .0140000, .0162500, .0186667,
.0212500, .0240000, .0269167, .0300000, .0332500,
.0366667, .0402500, .0440000, .0479167, .0520000,
.0562500, .0606667, .0652500, .0700000, .0749167,
.0800000, .0852500, .0906668, .0962505, .1020017,
.1079213, .1140113, .1202745, .1267154, .1333406,
.1401592, .1471838, .1544313, .1619238, .1696895,
.1777643, .1861929, .1950307, .2043451, .2142178,
.2247466, .2360480, .2482597, .2615432, .2760868,
.2921094, .3098631, .3296378, .3517651, .3766222,
.4046373, .4362943, .4721379, .5127798, .5589045,
.6112759, .6707432, .7382500, .8148403, .9016668,
1.0000000,
eta_rho=
.0001250, .0004583, .0009583, .0016250, .0024583,
.0034583, .0046250, .0059583, .0074583, .0091250,
.0109583, .0129583, .0151250, .0174583, .0199583,
.0226250, .0254583, .0284583, .0316250, .0349583,
.0384583, .0421250, .0459583, .0499583, .0541250,
.0584584, .0629583, .0676250, .0724583, .0774583,
.0826250, .0879584, .0934586, .0991261, .1049615,
.1109663, .1171429, .1234950, .1300280, .1367499,
.1436715, .1508076, .1581776, .1658067, .1737269,
.1819786, .1906118, .1996879, .2092815, .2194822,
.2303973, .2421538, .2549014, .2688150, .2840981,
.3009862, .3197505, .3407014, .3641936, .3906297,
.4204658, .4542161, .4924589, .5358422, .5850902,
.6410096, .7044966, .7765451, .8582535, .9508334,
```

/

Level set L63(50_t,13_s)₄₀

&VERTLEVS

```
z_top_of_model = 41022.39,
first_constant_r_rho_level= 50,
eta_theta=
0.0000000E+00, 4.8753872E-04, 1.3001683E-03, 2.4376935E-03, 3.9003098E-03,
5.6880168E-03, 7.8006196E-03, 1.0238313E-02, 1.3001097E-02, 1.6088778E-02,
1.9501548E-02, 2.3239411E-02, 2.7302168E-02, 3.1690016E-02, 3.6402956E-02,
4.1440792E-02, 4.6803717E-02, 5.2491732E-02, 5.8504645E-02, 6.4842649E-02,
7.1505740E-02, 7.8493737E-02, 8.5806817E-02, 9.3444988E-02, 1.0140806E-01,
1.0969621E-01, 1.1830946E-01, 1.2724760E-01, 1.3651083E-01, 1.4609917E-01,
1.5601239E-01, 1.6625071E-01, 1.7681430E-01, 1.8770337E-01, 1.9891910E-01,
2.1046326E-01, 2.2233970E-01, 2.3455390E-01, 2.4711467E-01, 2.6003483E-01,
2.7333215E-01, 2.8703120E-01, 3.0116495E-01, 3.1577647E-01, 3.3092082E-01,
3.4666792E-01, 3.6310497E-01, 3.8034007E-01, 3.9850461E-01, 4.1775790E-01,
4.3829069E-01, 4.6033016E-01, 4.8414484E-01, 5.1004976E-01, 5.3841203E-01,
5.6965858E-01, 6.0428101E-01, 6.4284474E-01, 6.8599641E-01, 7.3447162E-01,
7.8910542E-01, 8.5084140E-01, 9.2074203E-01, 1.0000000E+00,
eta_rho=
2.4376936E-04, 8.9375599E-04, 1.8688334E-03, 3.1690018E-03, 4.7940658E-03,
6.7442209E-03, 9.0194661E-03, 1.1619608E-02, 1.4544840E-02, 1.7795164E-02,
2.1370383E-02, 2.5270693E-02, 2.9496092E-02, 3.4046389E-02, 3.8921777E-02,
4.4122253E-02, 4.9647629E-02, 5.5498090E-02, 6.1673649E-02, 6.8174094E-02,
7.4999638E-02, 8.2150280E-02, 8.9625798E-02, 9.7426422E-02, 1.0555213E-01,
```

1. 1.1400293E-01, 1. 1.2277844E-01, 1. 1.3187923E-01, 1. 1.4130490E-01, 1. 1.5105568E-01,
1. 1.6113155E-01, 1. 1.7153251E-01, 1. 1.8225874E-01, 1. 1.9331124E-01, 1. 2.0469119E-01,
2. 1.640146E-01, 2. 2.2844680E-01, 2. 2.4083437E-01, 2. 2.5357473E-01, 2. 2.6668346E-01,
2. 2.8018168E-01, 2. 2.9409820E-01, 3. 3.0847082E-01, 3. 3.2334876E-01, 3. 3.3879438E-01,
3. 3.5488644E-01, 3. 3.7172252E-01, 3. 3.8942233E-01, 4. 4.0813133E-01, 4. 4.2802429E-01,
4. 4.4931039E-01, 4. 4.7223738E-01, 4. 4.9709725E-01, 5. 5.2423090E-01, 5. 5.5403531E-01,
5. 5.8696973E-01, 6. 6.2356299E-01, 6. 6.442049E-01, 7. 7.1023387E-01, 7. 7.6178843E-01,
8. 1.1997347E-01, 8. 8.8579178E-01, 9. 9.6037108E-01,

4 Namelist differences between GA6.0/GL6.0 and GA6.1/GL6.1

Section 4 of the main paper describes the GA6.1/GL6.1 “branch” configuration that is used for operational global NWP, which includes a number of scientific differences from the GA6.0/GL6.0 “trunk” configuration. Table 3 lists the UM settings (as set in the Rose suite applications) that should be changed when changing from GA6.0/GL6.0 to GA6.1/GL6.1; all of these (except for [namelist:jules_sea_seaice] and [namelist:run_convection]) are related to GL6.1’s use of a single aggregated surface tile. The settings listed here are valid for UM code base vn10.3.

namelist entry	GA6.0/GL6.0	GA6.1/GL6.1
[namelist:jules_elevate]		
l_elev_absolute_height	9*.false.	“trigger ignored”
surf_hgt_io	9*0.00	“trigger ignored”
[namelist:jules_nvegparm]		
ch_nvg_io(2)	2.11e+7	0.0
vf_nvg_io(2)	1.0	0.0
[namelist:jules_pftparm]		
z0hm_pft_io	2*1.65,3*0.1	5*0.1
[namelist:jules_sea_seaice]		
kappai	2.63	2.09
kappai_snow	0.50	0.31
[namelist:jules_snow]		
l_snowdep_surf	.true.	.false.
[namelist:jules_surface]		
i_aggregate_opt	“trigger ignored”	1
l_aggregate	.false.	.true.
[namelist:jules_vegetation]		
can_model	3	4
[namelist:recon]		
l_canopy_snow_throughfall	.true.	“trigger ignored”
[namelist:run_convection]		
cape_timescale	3600	1800

Table 3: UM settings that differ between GA6.0/GL6.0 and GA6.1/GL6.1

5 Settings that may vary with system/application

As described in the main paper, GA6.0/GL6.0 (or GA6.1/GL6.1) defines the scientific configuration of the UM and JULES components used in various systems. In addition to the differences with horizontal and vertical resolution described above — and the scientific differences between

GA6.0/GL6.0 and GA6.1/GL6.1 — there are some settings that may be seen as system dependent, which we illustrate in this section. In Table 4 we illustrate an example of the systems settings that vary between deterministic global NWP and climate research configurations of GA6.0/GL6.0. Note that this is just a description of the scientific differences rather than a full list of technical options/namelist entries that would need to be changed to apply these changes.

A good example of such a difference is the use of conservative advection for moist variables and tracers. For the advection scheme to exactly conserve these variables requires use of the computationally more expensive conservation algorithm. This is necessary for long free-running integrations, such as those used for climate projections. For short forecast runs, however, this is not necessary; because the process of data assimilation (DA) of atmospheric moisture and tracers will not precisely conserve the mass of these tracers, it is not necessary to leave this on for the integrity of the continuous assimilation cycle.

Area of the model Scientific option	NWP	Climate
Time dependent options		
Calendar type	Gregorian	360 day*
Method for calculating global sums		
Summation type	Non-reproducible	Double-double precision
Definition of land/sea		
Use of “coastal tiling”	Off	On
Global conservation options		
Conservative moisture/tracer advection	Off	On
Enforced energy conservation	Off	On
Aerosol modelling		
Prognostic/climatological aerosol	Climatological**	Prognostic

Table 4: A descriptive example of GA6.0 settings that might vary with system/application. *Note that the 360 day calendar is not compulsory for GA6.0 climate jobs, but is still used in mode standard jobs. ** As discussed in the main paper, the aerosol definition is dependent on the system. Most climate runs use full CLASSIC aerosol with offline oxidants. Runs on Seasonal timescales or shorter use CLASSIC aerosol climtologies. Finally, we now usually include prognostic mineral dust forecasting and assimilation on NWP timescales.

6 Example Rose/UM namelists for a GA6.0/GL6.0 job

Here, we include a set of UM and JULES Rose namelists for a GA6.0/GL6.0 job at UM code base vn10.3. The job in question is an N96 resolution (≈ 135 km in the mid-latitudes) L85(50_t,35_s)₈₅ level set Atmosphere/Land-only climate simulation similar to that used for several of the results in Sect. 5 of the main paper.

Note that for the interest of brevity, we have stripped out all “trigger ignored” variables (which are not read by the model) and all namelist entries that detail the diagnostic requests (i.e. [namelist:domain(...)], [namelist:streq(...)], [namelist:time(...)], [namelist:use(...)])

```
meta=um-atmos/vn10.3
```

```
[command]
default=um-atmos
recon=um-recon
```

```
[env]
ATMOS_KEEP_MPP_STDOUT=true
ATMOS_STDOUT_FILE=pe_output/${RUNID}.fort6.pe
COUPLER=
DATAM=$DATAM
DR_HOOK=0
ENS_MEMBER=0
HISTORY=$DATAM/${RUNID}.xhist
MPICH_COLL_SYNC=MPI_Gatherv
MPICH_GNI_MAX_EAGER_MSG_SIZE=65536
MPICH_GNI_MAX_VSHORT_MSG_SIZE=8192
MPICH_MAX_THREAD_SAFETY=multiple
OMP_STACKSIZE=2G
PRINT_STATUS=PrStatus_Normal
RCF_PRINTSTATUS=PrStatus_Normal
RCF_TIMER=false
RECON_KEEP_MPP_STDOUT=true
RECON_STDOUT_FILE=pe_output/${RUNID}.fort6.pe
RUNID=$RUNID
SPECTRAL_FILE_DIR=$UMDIR/vn$VN/ctldata/spectral/ga3_0
UM_THREAD_LEVEL=MULTIPLE
VN=10.3
XLSMPOPTS=stack=1000000000
```

```
[file:$DATAM]
mode=mkdir
source=
```

```
[file:ATMOSCNTL]
source=namelist:configid namelist:nlstcgen namelist:nlst_mpp namelist:run_track
      =namelist:run_stochastic namelist:run_calc_pmsl namelist:lbc_options
      =namelist:run_nudging namelist:run_sl namelist:run_diffusion namelist:run_cosp
      =namelist:radfcia namelist:r2swcInl namelist:r2lwclnl namelist:clmchfcg
      =namelist:acp namelist:acdiag namelist:jules_nvegparm namelist:jules_pftparm
      =namelist:jules_triffid namelist:jules_elevate namelist:urban2t_param namelist:iau_nl
      =namelist:nlstcall_pp(:)
```

```
[file:IDEALISE]
source=(namelist:idealise)
```

```
[file:IOSCNTL]
source=namelist:ioscntl namelist:io_control namelist:prnt_control (namelist:lustre_control)
      =(namelist:lustre_control_custom_files)
```

```
[file:RECONA]
source=namelist:recon namelist:vertical namelist:horizont namelist:headers (namelist:trans(:))
```

```
[ file : SHARED ]
source=namelist:nlcfiles namelist:nlstcall namelist:ancilcta namelist:temp_fixes
      =namelist:carbon_options namelist:coupling_control namelist:model_domain
      =namelist:planet_constants namelist:run_dust namelist:run_ukca namelist:run_gwd
      =namelist:run_murk namelist:run_convection namelist:run_bl namelist:run_rivers
      =namelist:run_precip namelist:run_radiation namelist:run_cloud namelist:run_aerosol
      =namelist:lam_config namelist:run_ozone namelist:run_free_tracers namelist:run_eng_corr
      =namelist:gen_phys_inputs namelist:run_dyn namelist:run_dyntest
      =namelist:jules_surface_types namelist:jules_surface namelist:jules_radiation
      =namelist:jules_hydrology namelist:jules_sea_ice namelist:jules_soil
      =namelist:jules_vegetation namelist:jules_snow namelist:urban_switches
      =namelist:run_electric namelist:ancilcta (namelist:items(:))
```

```
[ file : SIZES ]
source=namelist:nlsizes
```

```
[ file : STASHC ]
source=(namelist:streq(:)) (namelist:domain(:)) (namelist:time(:)) (namelist:use(:))
```

```
[ namelist : acdiag ]
```

```
[ namelist : acp ]
lac_mes=.false.
```

```
[ namelist : ancilcta ]
l_stanom=.false.
lamipii=.true.
nancil_lookupsa=50000
```

```
[ namelist : carbon_options ]
i_co2_opt=2
```

```
[ namelist : clmchfcg ]
clim_fcg_levels_cfc11=36*-32768.0
clim_fcg_levels_cfc113=36*-32768.0
clim_fcg_levels_cfc114=36*-32768.0
clim_fcg_levels_cfc12=1.883e-9,2.031e-9,2.168e-9,2.300e-9,2.434e-9,2.560e-9,
      =2.690e-9,2.832e-9,2.973e-9,3.124e-9,3.295e-9,3.466e-9,
      =3.617e-9,3.755e-9,3.873e-9,3.961e-9,4.024e-9,4.065e-9,
      =4.099e-9,4.126e-9,4.142e-9,4.155e-9,4.169e-9,4.179e-9,
      =4.188e-9,4.191e-9,4.191e-9,4.189e-9,4.181e-9,4.168e-9,
      =4.156e-9,4.144e-9,4.130e-9,4.116e-9,4.101e-9,4.086e-9
clim_fcg_levels_ch4=8.383e-7,8.474e-7,8.571e-7,8.677e-7,8.785e-7,8.893e-7,
      =8.992e-7,9.071e-7,9.140e-7,9.205e-7,9.265e-7,9.323e-7,
      =9.379e-7,9.436e-7,9.480e-7,9.505e-7,9.531e-7,9.560e-7,
      =9.581e-7,9.607e-7,9.651e-7,9.687e-7,9.697e-7,9.695e-7,
      =9.703e-7,9.718e-7,9.719e-7,9.712e-7,9.716e-7,9.731e-7,
      =9.748e-7,9.767e-7,9.786e-7,9.804e-7,9.822e-7,9.840e-7
clim_fcg_levels_co2=5.08676e-4,5.11224e-4,5.14012e-4,5.16089e-4,5.17707e-4,
      =5.19842e-4,5.22249e-4,5.24528e-4,5.26830e-4,5.29636e-4,
      =5.32815e-4,5.35473e-4,5.37551e-4,5.39317e-4,5.40635e-4,
      =5.41990e-4,5.44041e-4,5.46639e-4,5.49108e-4,5.51679e-4,
      =5.54971e-4,5.58048e-4,5.60353e-4,5.62787e-4,5.65909e-4,
      =5.69308e-4,5.72426e-4,5.75464e-4,5.78525e-4,5.81488e-4,
      =5.84560e-4,5.87819e-4,5.91135e-4,5.94394e-4,5.97657e-4,
      =6.00941e-4
clim_fcg_levels_hcfc22=36*-32768.0
clim_fcg_levels_hfc125=36*-32768.0
clim_fcg_levels_hfc134a=7.794e-11,8.231e-11,8.697e-11,9.195e-11,9.721e-11,1.026e-10,
      =1.082e-10,1.139e-10,1.198e-10,1.262e-10,1.328e-10,1.394e-10,
      =1.463e-10,1.535e-10,1.611e-10,1.692e-10,1.784e-10,1.897e-10,
      =2.042e-10,2.216e-10,2.410e-10,2.621e-10,2.851e-10,3.122e-10,
```



```

        =3.434e-10,3.761e-10,4.107e-10,4.466e-10,4.826e-10,5.193e-10,
        =5.567e-10,5.939e-10,6.312e-10,6.687e-10,7.066e-10,7.449e-10
clim_fcg_levels_n2o=4.560e-7,4.570e-7,4.580e-7,4.592e-7,4.606e-7,4.617e-7,
        =4.626e-7,4.636e-7,4.646e-7,4.654e-7,4.668e-7,4.688e-7,
        =4.703e-7,4.712e-7,4.720e-7,4.727e-7,4.735e-7,4.746e-7,
        =4.757e-7,4.768e-7,4.780e-7,4.791e-7,4.800e-7,4.809e-7,
        =4.821e-7,4.833e-7,4.843e-7,4.854e-7,4.866e-7,4.876e-7,
        =4.887e-7,4.897e-7,4.908e-7,4.918e-7,4.929e-7,4.939e-7
clim_fcg_levels_so4=36*-32768.0
clim_fcg_nyears_cfc11=0
clim_fcg_nyears_cfc113=0
clim_fcg_nyears_cfc114=0
clim_fcg_nyears_cfc12=36
clim_fcg_nyears_ch4=36
clim_fcg_nyears_co2=36
clim_fcg_nyears_hcfc22=0
clim_fcg_nyears_hfc125=0
clim_fcg_nyears_hfc134a=36
clim_fcg_nyears_n2o=36
clim_fcg_nyears_so4=0
clim_fcg_rates_cfc11=36*-32768.0
clim_fcg_rates_cfc113=36*-32768.0
clim_fcg_rates_cfc114=36*-32768.0
clim_fcg_rates_cfc12=36*-32768.0
clim_fcg_rates_ch4=36*-32768.0
clim_fcg_rates_co2=36*-32768.0
clim_fcg_rates_hcfc22=36*-32768.0
clim_fcg_rates_hfc125=36*-32768.0
clim_fcg_rates_hfc134a=36*-32768.0
clim_fcg_rates_n2o=36*-32768.0
clim_fcg_rates_so4=36*-32768.0
clim_fcg_years_cfc11=36*-32768
clim_fcg_years_cfc113=36*-32768
clim_fcg_years_cfc114=36*-32768
clim_fcg_years_cfc12=1978,1979,1980,1981,1982,1983,1984,1985,1986,1987,1988,1989,
        =1990,1991,1992,1993,1994,1995,1996,1997,1998,1999,2000,2001,
        =2002,2003,2004,2005,2006,2007,2008,2009,2010,2011,2012,2013
clim_fcg_years_ch4=1978,1979,1980,1981,1982,1983,1984,1985,1986,1987,1988,1989,
        =1990,1991,1992,1993,1994,1995,1996,1997,1998,1999,2000,2001,
        =2002,2003,2004,2005,2006,2007,2008,2009,2010,2011,2012,2013
clim_fcg_years_co2=1978,1979,1980,1981,1982,1983,1984,1985,1986,1987,1988,1989,
        =1990,1991,1992,1993,1994,1995,1996,1997,1998,1999,2000,2001,
        =2002,2003,2004,2005,2006,2007,2008,2009,2010,2011,2012,2013
clim_fcg_years_hcfc22=36*-32768
clim_fcg_years_hfc125=36*-32768
clim_fcg_years_hfc134a=1978,1979,1980,1981,1982,1983,1984,1985,1986,1987,1988,1989,
        =1990,1991,1992,1993,1994,1995,1996,1997,1998,1999,2000,2001,
        =2002,2003,2004,2005,2006,2007,2008,2009,2010,2011,2012,2013
clim_fcg_years_n2o=1978,1979,1980,1981,1982,1983,1984,1985,1986,1987,1988,1989,
        =1990,1991,1992,1993,1994,1995,1996,1997,1998,1999,2000,2001,
        =2002,2003,2004,2005,2006,2007,2008,2009,2010,2011,2012,2013
clim_fcg_years_so4=36*-32768
l_clmchfcg=.true.
l_acts_fcg_rates=.false.

[ namelist : configid ]

[ namelist : coupling_control ]

[ namelist : gen_phys_inputs ]
l_leads_temp_prog=.false.
l_mr_physics1=.false.
l_mr_physics2=.false.

```

```

l_use_methox=.true.

[namelist:headers]
i_dump_year=1988

[namelist:horizont]
h_int_method=1
l_limit_rotations=.false.
orog_blend_weights=0
smcp_int_nearest_neighbour=.false.

[namelist:iau_n1]
l_iau=.false.

aa_jet_a=0.0
aa_jet_m=1
aa_jet_n=1
aa_jet_u0=0.0
b_const=2
base_frictional_timescale=1.1574e-5
base_xi1=0.0
base_xi2=0.0
big_factor=1.0
big_layers=0
brunt_vaisala=0.01
cool_rate=0.0
delta_xi1=0.0
delta_xi1_h=0.0
delta_xi1_l=0.0
delta_xi2=0.0
delta_xi2_h=0.0
delta_xi2_l=0.0
diffuse_dse_ap1=.false.
diffuse_dse_ap2=.false.
diffuse_q_ap1=.false.
diffuse_q_ap2=.false.
diffuse_u_ap1=.false.
diffuse_u_ap2=.false.
diffuse_v_ap1=.false.
diffuse_v_ap2=.false.
dmptim=0.0
do_evap_ap1=.false.
do_evap_ap2=.false.
do_limit_surf_theta=.false.
do_precip_ap1=.false.
do_precip_ap2=.false.
do_radiation_lw_ap1=.false.
do_radiation_lw_ap2=.false.
do_radiation_sw_ap1=.false.
do_radiation_sw_ap2=.false.
do_surface_drag_ap1=.false.
do_surface_drag_ap2=.false.
do_surface_flux_ap1=.false.
do_surface_flux_ap2=.false.
dtheta_dz1=0.01,0.01,0.01
eccentricity=0.0
f_plane=-90.0
ff_plane=-90.0
first_constant_r_rho_level_new=1
first_theta_height=10.0
grid_flat=3
grid_number=10
grow_steps=0

```

```

h_o=0.0
half_width_x=2500000.0
half_width_y=2500000.0
hdmp=0.0
height_domain=10000.0
height_dz1=0.0,0.0
height_u_in=0.0,0.0,0.0
hf=0.0
idl_bubble_depth=1000.0,1000.0,1000.0
idl_bubble_height=1000.0,1000.0,1000.0
idl_bubble_max=1.0,1.0,1.0
idl_bubble_option=0,0,0
idl_bubble_width=1000.0,1000.0,1000.0
idl_bubble_xoffset=0.5,0.5,0.5
idl_bubble_yoffset=0.5,0.5,0.5
idl_interp_option=1
idlsurffluxseaoption=0
idlsurffluxseaparams=0.0,0.0,0.0,0.0
k_const=3
l_baro_inst=.false.
l_baro_perturbed=.false.
l_baroclinic=.false.
l_bomex=.false.
l_cartesian=.false.
l_code_test=.false.
l_const_grav=.true.
l_constant_dz=.true.
l_cyclone=.false.
l_damp=.false.
l_deep_baro_inst=.false.
l_fix_orog_hgt_lbc=.false.
l_fixed_lbc=.false.
l_force_lbc=.false.
l_frierson=.false.
l_geo_for=.false.
l_heldsuarez=.false.
l_heldsuarez1_drag=.true.
l_idl_bubble_saturate=.false.
l_initialise_data=.false.
l_perturb_correlate_time=.true.
l_perturb_correlate_tq=.true.
l_perturb_correlate_vert=.true.
l_perturb_q=.false.
l_perturb_t=.false.
l_pforce=.false.
l_polar_wind_zero=.false.
l_pressure_balance=.false.
l_rotate_grid=.false.
l_rotate_winds=.false.
l_sh_williamson=.false.
l_shallow=.false.
l_solid_body=.false.
l_spec_z0=.false.
l_trivial_trigs=.false.
l_vert_coriolis=.false.
l_wind_balance=.false.
lambda_fraction=0.5
newtonian_timescale=3600.0
num_pforce_times=1
num_profile_data=100
num_qforce_times=1
num_tforce_times=1
num_uvforce_times=1

```

```

num_uvprofile_data=0
nxi1l=0
nxi1v=0
nxi2l=0
nxi2v=0
orog_hgt_lbc=0.0
p_surface=100000.0
perturb_height=0.0,0.0
perturb_magnitude_q=0.5e-3
perturb_magnitude_t=0.5
perturb_type=1
pforce_option=0
pforce_time_interval=600.0
phi_fraction=0.5
plat_size_x=0.0
plat_size_y=0.0
q1=70.0
qforce_option=0
qforce_time_interval=600.0
qprofile_data=100*0.0
qprofile_number=10
r_plane=-90.0
roughlen_z0h=0.0
roughlen_z0m=0.0
suhe_fric=2
suhe_newtonian_timescale_ka=2.893e-7
suhe_newtonian_timescale_ks=2.893e-6
suhe_pole_equ_deltat=60.0
suhe_relax=2
suhe_sigma_cutoff=0.7
suhe_static_stab=10.0
surface_type=10
t0_e=310.0
t0_p=240.0
t_horizfn_data=0.0,0.0,0.0,0.0
t_horizfn_number=0
t_surface=280.0
tforce_option=0
tforce_time_interval=600.0
theta_surface=280.0
thin_theta_height=1.0
tprofile_data=100*0.0
tprofile_number=10
transit_layers=0
tropics_deg=30.0
tstep_plot_frequency=1
tstep_plot_start=-1
u_geo=0.0
u_in=0.0,0.0,0.0,0.0
u_ramp_end=-90.0
u_ramp_start=0.0
u_jet_lat=-90.0
u_jet_width=0.0
uprofile_data=100*0.0
uv_horizfn_number=0
uvforce_option=0
uvforce_time_interval=600.0
uvprofile_number=10
v_geo=0.0
v_in=0.0,0.0,0.0,0.0
vert_grid_ratio=1.0
vprofile_data=100*0.0
witch_power=1.5

```

```

z_uvprofile_data=100*0.0
zdmp=0.0
zprofile_data=100*0.0
zprofile_orog=0.0

[namelist : io_control]
io_external_control=.false.
io_filesystem_profile=0
io_timing=0
l_postp=.true.
print_runtime_info=.false.

[namelist : ioscntl]
ios_acquire_model_prsts=.true.
ios_as_concurrency=20
ios_async_levs_per_pack=76
ios_backoff_interval=1000
ios_buffer_size=1500
ios_concurrency=40
ios_concurrency_max_mem=40
ios_decomp_model=0
ios_local_ro_files=.true.
ios_lock_meter=.false.
ios_offset=0
ios_print_start_time=.false.
ios_relaytoslaves=.false.
ios_serialise_mpi_calls=.false.
ios_spacing=32
ios_tasks_per_server=1
ios_thread_0_calls_mpi=.false.
ios_timeout=120
ios_unit_alloc_policy=1
ios_use_async_dump=.false.
ios_use_async_stash=.false.
ios_use_helpers=.false.
ios_verbosity=3

[namelist : items(25d80b08)]
ancilfilename='$SUM Ancil_SULPOXID_DIR/$SUM Ancil_SULPOXID_FILE'
domain=1
interval=5
period=3
source=4
stash_req=122,123,124,125
update_anc=.true.

[namelist : items(2b72fb4e)]
ancilfilename='$SUM Ancil_OCFF_DIR/$SUM Ancil_OCFF_FILE'
domain=1
interval=5
period=3
source=4
stash_req=135
update_anc=.true.

[namelist : items(363d91cc)]
ancilfilename=''
domain=1
source=3
stash_req=235
update_anc=.false.

[namelist : items(37097c75)]

```

```
ancilfilename=''
domain=1
source=8
stash_req=49
update_anc=.false.
```

```
[namelist:items(55bbaa8b)]
ancilfilename='$UM_ANCIL_MASK_DIR/$UM_ANCIL_LANDFRAC_FILE'
domain=1
source=2
stash_req=505
update_anc=.false.
```

```
[namelist:items(574b8ac2)]
ancilfilename='$UM_ANCIL_BIOM_DIR/$UM_ANCIL_BIOM_FILE'
domain=1
interval=5
period=3
source=4
stash_req=130,131
update_anc=.true.
```

```
[namelist:items(58a5f62c)]
ancilfilename='$UM_ANCIL_OROG_DIR/$UM_ANCIL_OROG_FILE'
domain=1
source=2
stash_req=5,6,17,18,33,34,35,36,37
update_anc=.false.
```

```
[namelist:items(5b72294c)]
ancilfilename='$UM_ANCIL_SULPDMS_DIR/$UM_ANCIL_SULPDMS_FILE'
domain=1
interval=5
period=3
source=4
stash_req=132
update_anc=.true.
```

```
[namelist:items(674e0d66)]
ancilfilename='$UM_ANCIL_LSH_TOPIND_DIR/$UM_ANCIL_LSH_TINDSD_FILE'
domain=1
source=2
stash_req=275
update_anc=.false.
```

```
[!namelist:items(690fef5c)]
ancilfilename='$UM_ANCIL_ARCLOCFF_DIR/$UM_ANCIL_ARCLOCFF_FILE'
domain=1
interval=5
period=3
source=4
stash_req=368,369,370
update_anc=.true.
```

```
[namelist:items(70ff75c2)]
ancilfilename='$UM_ANCIL_GENLAND_DIR/$UM_ANCIL_GENLAND_FILE'
domain=1
interval=5
period=3
source=4
stash_req=243
update_anc=.true.
```

```

[namelist : items (713e11b2)]
ancilfilename = '$UM Ancil_Soot_Dir/$UM Ancil_Soot_File'
domain = 1
interval = 5
period = 3
source = 4
stash_req = 129
update_anc = .true.

[namelist : items (7180ded3)]
ancilfilename = '$UM Ancil_Ozone_Dir/$UM Ancil_Ozone_File'
domain = 1
interval = 30
period = 3
source = 4
stash_req = 60
update_anc = .true.

[namelist : items (765f4ed6)]
ancilfilename = ''
domain = 1
source = 3
stash_req = 222
update_anc = .false.

[namelist : items (83896be3)]
ancilfilename = '$UM Ancil_Biogenic_Dir/$UM Ancil_Biogenic_File'
domain = 1
interval = 5
period = 3
source = 4
stash_req = 351
update_anc = .true.

[namelist : items (94bba9c7)]
ancilfilename = '$UM Ancil_Vegfrac_Dir/$UM Ancil_Vegfrac_File'
domain = 1
source = 2
stash_req = 216
update_anc = .false.

[namelist : items (94f6e627)]
ancilfilename = '$UM Ancil_Mask_Dir/$UM Ancil_Mask_File'
domain = 1
source = 2
stash_req = 30
update_anc = .false.

[! namelist : items (9691c4f0)]
ancilfilename = '$UM Ancil_ArclsslT_Dir/$UM Ancil_ArclsslT_File'
domain = 1
interval = 5
period = 3
source = 4
stash_req = 357,358
update_anc = .true.

[namelist : items (acb75b28)]
ancilfilename = '$UM Ancil_Trip_Seq_Dir/$UM Ancil_Trip_Seq_File'
domain = 1
source = 2
stash_req = 151,152
update_anc = .false.

```

```
[! namelist : items ( b5084cd6 )]  
ancilfilename = '$UM_ANCIL_ARCLBIOM_DIR/$UM_ANCIL_ARCLBIOM_FILE '  
domain=1  
interval=5  
period=3  
source=4  
stash_req = 352,353,354  
update_anc = . true .
```

```
[! namelist : items ( b663b6a1 )]  
ancilfilename = '$UM_ANCIL_ARCLBLCK_DIR/$UM_ANCIL_ARCLBLCK_FILE '  
domain=1  
interval=5  
period=3  
source=4  
stash_req = 355,356  
update_anc = . true .
```

```
[ namelist : items ( b6645915 )]  
ancilfilename = '$UM_ANCIL_SEAICE_DIR/$UM_ANCIL_SEAICE_FILE '  
domain=1  
interval=1  
period=3  
source=4  
stash_req = 31,32  
update_anc = . true .
```

```
[! namelist : items ( bb46b0af )]  
ancilfilename = '$UM_ANCIL_ARCLSULP_DIR/$UM_ANCIL_ARCLSULP_FILE '  
domain=1  
interval=5  
period=3  
source=4  
stash_req = 359,360,361  
update_anc = . true .
```

```
[ namelist : items ( bd7c0625 )]  
ancilfilename = '$UM_ANCIL_SULPSURF_DIR/$UM_ANCIL_SULPSURF_FILE '  
domain=1  
interval=5  
period=3  
source=4  
stash_req = 58,59,126  
update_anc = . true .
```

```
[ namelist : items ( cdfdae0 )]  
ancilfilename = '$UM_ANCIL_TRIP_STOR_DIR/$UM_ANCIL_TRIP_STOR_FILE '  
domain=1  
source=2  
stash_req = 153  
update_anc = . false .
```

```
[ namelist : items ( d4e6dec6 )]  
ancilfilename = '$UM_ANCIL_LSH_TOPIND_DIR/$UM_ANCIL_LSH_TINDMN_FILE '  
domain=1  
source=2  
stash_req = 274  
update_anc = . false .
```

```
[ namelist : items ( e96a263d )]  
ancilfilename = '$UM_ANCIL_SOIL_DIR/$UM_ANCIL_SOIL_FILE '  
domain=1
```



```

source=2
stash_req=40,41,43,44,46,47,48,207,220,223
update_anc=.false.

[namelist:items(eb3ee851)]
ancilfilename='$UM Ancil_SST_DIR/$UM Ancil_SST_FILE'
domain=1
interval=1
period=3
source=4
stash_req=24
update_anc=.true.

[namelist:items(f0120e3b)]
ancilfilename=''
domain=1
source=3
stash_req=34150
update_anc=.false.

[namelist:items(f605e955)]
ancilfilename='$UM Ancil_SULPVOLC_DIR/$UM Ancil_SULPVOLC_FILE'
domain=1
source=2
stash_req=121
update_anc=.false.

[namelist:items(fa9c8498)]
ancilfilename='$UM Ancil_VEGFUNC_DIR/$UM Ancil_VEGFUNC_FILE'
domain=1
interval=5
period=3
source=4
stash_req=217,218
update_anc=.true.

[namelist:items(fe0f7435)]
ancilfilename='$UM Ancil_SOILDUST_DIR/$UM Ancil_SOILDUST_FILE'
domain=1
source=2
stash_req=418,419,420,421,422,423,424,425,426
update_anc=.false.

[namelist:jules_elevate]
l_elev_absolute_height=9*.false.
surf_hgt_io=9*0.00

[namelist:jules_hydrology]
l_hydrology=.true.
l_pdm=.false.
l_top=.true.
l_var_rainfrac=.false.
l_wetland_ch4_npp=.false.
l_wetland_unfrozen=.false.

[namelist:jules_nvegparm]
albsnc_nvgeo=4.00000e-1,8.00000e-1,8.00000e-1,8.00000e-1
albsnf_nvgeo=1.80000e-1,1.20000e-1,-1.00000,7.50000e-1
albsnf_nvgl_io=0.16,0.06,0.03,0.75
albsnf_nvgu_io=0.20,0.15,0.80,0.75
catch_nvgeo=5.00000e-1,0.00000,0.00000,0.00000
ch_nvgeo=2.80000e+5,2.11000e+7,0.00000,0.00000
emis_nvgeo=9.70000e-1,9.85000e-1,9.00000e-1,9.90000e-1

```

```

gs_nvlg_io=0.00000,0.00000,1.00000e-2,1.00000e+6
infil_nvlg_io=1.00000e-1,0.00000,5.00000e-1,0.00000
vf_nvlg_io=1.00000,1.00000,0.00000,0.00000
z0_nvlg_io=1.00000,1.00000e-4,1.00000e-3,5.00000e-4
z0hm_classic_nvlg_io=1.00000e-1,1.00000e-1,1.00000e-1,1.00000e-1
z0hm_nvlg_io=1.00000e-7,2.50000e-1,2.00000e-2,2.00000e-1

[ namelist : jules_pftparm ]
a_wl_io=0.65,0.65,0.005,0.005,0.10
a_ws_io=10.00,10.00,1.00,1.00,10.00
albsnc_max_io=2.50000e-1,2.50000e-1,6.00000e-1,6.00000e-1,4.00000e-1
albsnc_min_io=3.00000e-1,3.00000e-1,8.00000e-1,8.00000e-1,8.00000e-1
albsnf_max_io=1.43000e-1,8.80000e-2,1.92000e-1,1.59000e-1,1.15000e-1
albsnf_maxl_io=0.095,0.059,0.128,0.106,0.077
albsnf_maxu_io=0.215,0.132,0.288,0.239,0.173
alnir_io=0.45,0.35,0.58,0.58,0.58
alnirl_io=0.30,0.23,0.39,0.39,0.39
alniru_io=0.68,0.53,0.87,0.87,0.87
alpar_io=0.10,0.07,0.10,0.10,0.10
alparl_io=0.06,0.04,0.06,0.06,0.06
alparu_io=0.15,0.11,0.15,0.15,0.15
alpha_io=0.08,0.08,0.08,0.040,0.08
b_wl_io=5*1.667
c3_io=1,1,1,0,1
catch0_io=5*5.00000e-1
dcatch_dlai_io=5*5.00000e-2
dgl_dm_io=5*0.0
dgl_dt_io=9.0,9.0,0.0,0.0,9.0
dqcrit_io=0.090,0.060,0.100,0.075,0.100
dust_veg_scj_io=0.0,0.0,1.0,1.0,0.5
dz0v_dh_io=5.00000e-2,5.00000e-2,1.00000e-1,1.00000e-1,1.00000e-1
emis_pft_io=0.9800,0.9900,0.9800,0.9800,0.9800
eta_sl_io=5*0.01
f0_io=0.875,0.875,0.900,0.800,0.900
fd_io=0.015,0.015,0.015,0.025,0.015
fsmc_of_io=5*0.00
g_leaf_0_io=5*0.25
glmin_io=5*1.0e-6
infil_f_io=4.00000,4.00000,2.00000,2.00000,2.00000
kext_io=5*5.00000e-1
kn_io=5*0.78
kpar_io=5*0.50
lai_alb_lim_io=5*0.5
lma_io=0.0824,0.2263,0.0498,0.1370,0.0695
neff_io=0.8e-3,0.8e-3,0.8e-3,0.4e-3,0.8e-3
nl0_io=0.040,0.030,0.060,0.030,0.030
nmass_io=0.0210,0.0115,0.0219,0.0131,0.0219
nr_nl_io=5*1.00
ns_nl_io=0.10,0.10,1.00,1.00,0.10
omega_io=0.15,0.15,0.15,0.17,0.15
omegal_io=0.10,0.10,0.10,0.12,0.10
omegau_io=0.23,0.23,0.23,0.26,0.23
omnir_io=0.70,0.45,0.83,0.83,0.83
omnirl_io=0.50,0.30,0.53,0.53,0.53
omniru_io=0.90,0.65,0.98,0.98,0.98
orient_io=5*0
q10_leaf_io=5*2.00
r_grow_io=5*0.25
rootd_ft_io=3.00000,1.00000,5.00000e-1,5.00000e-1,5.00000e-1
sigl_io=0.0375,0.1000,0.0250,0.0500,0.0500
tleaf_of_io=273.15,243.15,258.15,258.15,243.15
tlow_io=0.0,-5.0,0.0,13.0,0.0
tupp_io=36.0,31.0,36.0,45.0,36.0

```

```
vint_io=5.73,6.32,6.42,0.00,14.71
vsl_io=29.81,18.15,40.96,10.24,23.15
z0hm_classic_pft_io=5*1.00000e-1
z0hm_pft_io=1.65000,1.65000,1.00000e-1,1.00000e-1,1.00000e-1
```

```
[namelist:jules_radiation]
i_sea_alb_method=2
l_albedo_obs=.true.
l_dolr_land_black=.false.
l_embedded_snow=.false.
l_mask_snow_orog=.false.
l_snow_albedo=.false.
l_spec_albedo=.false.
l_spec_sea_alb=.true.
wght_alb=0.0,0.5,0.0,0.5
```

```
[namelist:jules_sea_seaice]
alphac=0.80
alphan=0.72
buddy_sea=1
charnock=0.0180
dtice=2.00
emis_sea=0.9850
emis_sice=0.9760
iseasurfalg=1
kappa_seasurf=0.50
kappai=2.63
kappai_snow=0.50
l_cice_alb=.false.
l_ctile=.true.
l_saldep_freeze=.false.
l_sice_heatflux=.true.
l_sice_meltponds=.false.
l_sice_meltponds_cice=.false.
l_sice_multilayers=.false.
l_sice_scattering=.false.
l_sice_swpen=.false.
l_ssice_albedo=.false.
l_tstar_sice_new=.true.
nice=1
nice_use=1
seasalinityfactor=0.98
z0h_z0m_miz=0.200
z0h_z0m_sice=0.200
z0miz=1.00000e-1
z0sice=3.00000e-3
```

```
[namelist:jules_snow]
can_clump=5*0.0
cansnowpft=.false.,.true.,.false.,.false.,.false.
frac_snow_subl_melt=1
i_snow_cond_parm=0
l_et_metamorph=.false.
l_snow_infilt=.false.
l_snow_nocan_hc=.false.
l_snowdep_surf=.true.
lai_alb_lim_sn=5*0.5
n_lai_exposed=5*0.0
nsmax=0
unload_rate_cnst=5*0.0
unload_rate_u=5*0.0
```

```
[namelist:jules_soil]
```

```
dzsoil_io=0.1000,0.2500,0.6500,2.0000
l_dpsids_dsdz=.true.
l_soil_sat_down=.true.
l_vg_soil=.true.
soilhc_method=2
```

```
[namelist:jules_surface]
all_tiles=0
cor_mo_iter=3
fd_stab_dep=0
formdrag=1
i_modiscopt=0
iscrntdiag=2
isrfexcngust=1
l_aggregate=.false.
l_anthrop_heat_src=.false.
l_elev_lw_down=.false.
l_epot_corr=.true.
l_flake_model=.false.
l_land_ice_imp=.false.
l_point_data=.false.
l_vary_z0m_soil=.false.
orog_drag_param=0.15
```

```
[namelist:jules_surface_types]
brd_leaf=1
c3_grass=3
c4_grass=4
ice=9
lake=7
ndl_leaf=2
nnvg=4
npft=5
shrub=5
soil=8
urban=6
```

```
[namelist:jules_triffid]
alloc_fast_io=0.6,0.6,1.0,1.0,0.8
alloc_med_io=0.3,0.4,0.0,0.0,0.2
alloc_slow_io=0.1,0.0,0.0,0.0,0.0
crop_io=0,0,1,1,0
g_area_io=0.005,0.004,0.25,0.25,0.05
g_grow_io=5*20.00
g_root_io=5*0.25
g_wood_io=0.01,0.01,0.20,0.20,0.05
lai_max_io=9.00,9.00,4.00,4.00,4.00
lai_min_io=3.00,3.00,1.00,1.00,1.00
```

```
[namelist:jules_vegetation]
can_model=4
can_rad_mod=4
ilayers=10
l_bvoc_emis=.false.
l_ht_compete=.false.
l_landuse=.false.
l_phenol=.false.
l_q10=.true.
l_trait_phys=.false.
l_triffid=.false.
l_vegcan_soilfx=.false.
```

```
[namelist:lam_config]
```

```

[ namelist : lbc_options ]

default_stripe_count=0
default_stripe_offset=-1
default_stripe_pattern=0
default_stripe_size=0
number_custom_files=0

[ namelist : model_domain ]
l_regular=.true.
model_type=1

[ namelist : nlcfiles ]
astart='$ROSE_DATA/$RUNID.astart '
atmanl='unset '
streqlog='$DATAM/$RUNID.stash '

[ namelist : nlsizes ]
bl_levels=50
cloud_levels=85
global_row_length=192
global_rows=144
land_field=11271
model_levels=85
ozone_levels=85
st_levels=4
vert_lev='$UMDIR/vn$VN/ctldata/vert/vertlevs_L85_50t_35s_85km '

[ namelist : nlst_mpp ]
extended_halo_size_ew=4
extended_halo_size_ns=5
gcom_coll_limit=64
global_sum_method=2

[ namelist : nlstcall ]
ancil_reftime=1981,12,1,0,0,0
lcal360=.true.
lclimrealyr=.false.
ltimer=.false.
model_analysis_mins=0
model_basis_time=$MODELBASIS
num_albcs=0
run_target_end=$TASKEND

[ namelist : nlstcall_pp (pp0) ]
file_id='pp0'
filename_base='$DATAM/${RUNID}a.pa%C'
l_reinit=.true.
packing=5
reinit_end=-1
reinit_start=0
reinit_step=30
reinit_unit=2
reserved_headers=16000

[ namelist : nlstcall_pp (pp1) ]
file_id='pp1'
filename_base='$DATAM/${RUNID}a.pb%C'
l_reinit=.true.
packing=5
reinit_end=-1

```

```
reinit_start=0
reinit_step=90
reinit_unit=2
reserved_headers=0
```

```
[namelist : nlstcall_pp (pp10)]
file_id='pp10'
filename_base='$DATAM/${RUNID}a.pk%C'
l_reinit=.true.
packing=5
reinit_end=-1
reinit_start=0
reinit_step=30
reinit_unit=2
reserved_headers=16000
```

```
[namelist : nlstcall_pp (pp2)]
file_id='pp2'
filename_base='$DATAM/${RUNID}a.pc%C'
l_reinit=.true.
packing=5
reinit_end=-1
reinit_start=0
reinit_step=90
reinit_unit=2
reserved_headers=16000
```

```
[namelist : nlstcall_pp (pp3)]
file_id='pp3'
filename_base='$DATAM/${RUNID}a.pd%C'
l_reinit=.true.
packing=5
reinit_end=-1
reinit_start=0
reinit_step=30
reinit_unit=2
reserved_headers=16000
```

```
[namelist : nlstcall_pp (pp4)]
file_id='pp4'
filename_base='$DATAM/${RUNID}a.pe%C'
l_reinit=.true.
packing=5
reinit_end=-1
reinit_start=0
reinit_step=30
reinit_unit=2
reserved_headers=16000
```

```
[namelist : nlstcall_pp (pp5)]
file_id='pp5'
filename_base='$DATAM/${RUNID}a.pf%C'
l_reinit=.true.
packing=5
reinit_end=-1
reinit_start=0
reinit_step=90
reinit_unit=2
reserved_headers=0
```

```
[namelist : nlstcall_pp (pp6)]
file_id='pp6'
filename_base='$DATAM/${RUNID}a.pg%C'
```

```

l_reinit=.true.
packing=5
reinit_end=-1
reinit_start=0
reinit_step=90
reinit_unit=2
reserved_headers=16000

[namelist:nlstcall_pp(pp7)]
file_id='pp7'
filename_base='$DATAM/{RUNID}a.ph%C'
l_reinit=.true.
packing=5
reinit_end=-1
reinit_start=0
reinit_step=30
reinit_unit=2
reserved_headers=18000

[namelist:nlstcall_pp(pp8)]
file_id='pp8'
filename_base='$DATAM/{RUNID}a.pi%C'
l_reinit=.true.
packing=5
reinit_end=-1
reinit_start=0
reinit_step=90
reinit_unit=2
reserved_headers=0

[namelist:nlstcall_pp(pp9)]
file_id='pp9'
filename_base='$DATAM/{RUNID}a.pj%C'
l_reinit=.true.
packing=5
reinit_end=-1
reinit_start=0
reinit_step=90
reinit_unit=2
reserved_headers=0

[namelist:nlstcgen]
dump_filename_base='$DATAM/{RUNID}a.d%z%C'
dump_frequency_units=2
dump_packim=3
dumpfreqim=10
i_dump_output=2
l_meaning_sequence=.true.
mean_1_filename_base='$DATAM/{RUNID}a.p%C'
mean_2_filename_base='$DATAM/{RUNID}a.p%C'
mean_3_filename_base='$DATAM/{RUNID}a.p%C'
mean_4_filename_base='$DATAM/{RUNID}a.p%C'
mean_reftimeim=1981,12,1,0,0,0
meanfreqim=3,3,4,10
ppselectim=1,1,1,1
ppxm=5
psum_filename_base='$DATAM/{RUNID}a.s'
secs_per_periodim=86400
steps_per_periodim=72

[namelist:planet_constants]
i_eqt=1
i_planet=3

```

```
l_fix_solang=.false.  
l_planet_g=.false.  
l_planet_orbit=.false.  
l_set_planet_rotation=.false.  
sc=1361.0
```

```
[namelist:prnt_control]  
prnt_force_flush=.false.  
prnt_paper_width=80  
prnt_split_lines=.false.  
prnt_src_pref=.false.  
prnt_writers=1
```

```
[namelist:r2lwclnl]  
i_cnv_ice_lw=8  
i_cnv_water_lw=5  
i_gas_overlap_lw=6  
i_scatter_method_lw=1  
i_st_ice_lw=8  
i_st_water_lw=5  
l_cfc113_lw=.false.  
l_cfc114_lw=.false.  
l_cfc11_lw=.false.  
l_cfc12_lw=.true.  
l_ch4_lw=.true.  
l_co2_lw=.true.  
l_co_lw=.false.  
l_extra_top_lw=.false.  
l_h2_lw=.false.  
l_hcfc22_lw=.false.  
l_he_lw=.false.  
l_hfc125_lw=.false.  
l_hfc134a_lw=.true.  
l_k_lw=.false.  
l_microphysics_lw=.true.  
l_n2o_lw=.true.  
l_na_lw=.false.  
l_nh3_lw=.false.  
l_solar_tail_flux=.false.  
l_tio_lw=.false.  
l_vo_lw=.false.  
spectral_file_lw='sp_lw_ga3_0'
```

```
[namelist:r2swclnl]  
i_cnv_ice_sw=8  
i_cnv_water_sw=5  
i_gas_overlap_sw=5  
i_st_ice_sw=8  
i_st_water_sw=5  
l_ch4_sw=.false.  
l_co2_sw=.true.  
l_co_sw=.false.  
l_extra_top_sw=.false.  
l_h2_sw=.false.  
l_he_sw=.false.  
l_k_sw=.false.  
l_n2o_sw=.false.  
l_na_sw=.false.  
l_nh3_sw=.false.  
l_o2_sw=.true.  
l_tio_sw=.false.  
l_vo_sw=.false.  
spectral_file_sw='sp_sw_ga3_0'
```



```
[namelist : radfcdia]
```

```
[namelist : recon]
```

```
a_initial='$AINITIAL.N96'  
coast_adj_method=2  
dump_pack=3  
input_dump_type=1  
l_adj_t_soil=.false.  
l_canopy_snow_throughfall=.true.  
l_force_relayer=.false.  
l_rcf_init_flexi=.false.  
l_regularize_landice=.false.  
l_snow_tile_gbm_ancil_fix=.false.  
l_trans=.false.  
l_use_zero_frac_tile_temp=.true.  
l_validity_lookup_u=.false.  
q_min=1.000e-8  
reset_data_time=.true.  
select_output_fields=0  
use_smc_stress=.false.  
var_recon=.false.  
w_zero_end=-1  
w_zero_start=-1
```

```
[namelist : run_aerosol]
```

```
bmass_high_level_1=3  
bmass_high_level_2=20  
i_dms_flux=2  
l_biomass=.true.  
l_bmass_hilem=.true.  
l_bmass_lbc=.false.  
l_bmass_surem=.true.  
l_dms_em=.true.  
l_dms_em_inter=.true.  
l_dms_lbc=.false.  
l_nh3_em=.false.  
l_nh3_lbc=.false.  
l_nitr_lbc=.false.  
l_nitrate=.false.  
l_ocff=.true.  
l_ocff_hilem=.true.  
l_ocff_lbc=.false.  
l_ocff_surem=.false.  
l_so2_hilem=.true.  
l_so2_lbc=.false.  
l_so2_natem=.true.  
l_so2_surfem=.true.  
l_soot=.true.  
l_soot_hilem=.true.  
l_soot_lbc=.false.  
l_soot_surem=.false.  
l_sulpc_dms=.true.  
l_sulpc_nh3=.true.  
l_sulpc_online_oxidants=.false.  
l_sulpc_ozone=.true.  
l_sulpc_so2=.true.  
l_sulpc_so2_o3_nonbuffered=.true.  
l_use_bmass_sulpc=.true.  
l_use_nitrate_sulpc=.false.  
l_use_ocff_sulpc=.true.  
l_use_seasalt_pm=.false.  
l_use_seasalt_sulpc=.true.
```

```
l_use_sulphate_sulpc=.true.  
ocff_high_level=3  
so2_high_level=8  
soot_high_level=3
```

```
[namelist:run_bl]  
a_ent_shr_nml=5.0  
alpha_cd=2.0,49*1.5  
bl_res_inv=0  
bl_segment_size=16  
blending_option=0  
calc_prob_of_vis=0.400  
cbl_op=2  
dec_thres_cloud=0.10  
entr_enhance_by_cu=1  
entr_smooth_dec=0  
flux_grad=0  
fric_heating=1  
i_bl_vn=3  
idyndiag=4  
keep_ri_fa=1  
kprof_cu=0  
l_bl_mix_qcf=.true.  
l_full_lambdas=.false.  
l_lambdam2=.false.  
l_reset_dec_thres=.false.  
l_use_surf_in_ri=.false.  
lambda_min_nml=40.0  
local_fa=1  
nl_bl_levels=30  
prandtl=1  
pstb=2.000  
puns=0.500  
relax_sc_over_cu=0  
ritrans=0.1  
sbl_op=6  
sg_orog_mixing=0  
subs_couple_fix=1  
variable_ric=1  
zhloc_depth_fac=0.30
```

```
[namelist:run_calc_pmsl]  
l_pmsl_sor=.false.  
npmsl_height=500.00
```

```
[namelist:run_cloud]  
allicetdegc=-20.00  
cff_spread_rate=1.00e-3  
dbsdtbs_turb_0=1.50e-4  
falliceshear_method=2  
forced_cu=0  
i_cld_area=0  
i_pc2_conv_coupling=3  
i_pc2_erosion_method=3  
i_rhcpt=0  
ice_width=0.020  
l_add_cca_to_mcica=.false.  
l_ceil_cld_filter=.false.  
l_ensure_min_in_cloud_qcf=.true.  
l_fixbug_pc2_mixph=.true.  
l_micro_eros=.false.  
l_od_cld_filter=.true.  
l_pc2=.true.
```

```

l_pc2_check_init=.false.
l_sharpen_cbh_diags=.false.
l_subgrid_qv=.true.
rhcrit=0.920,0.918,0.916,0.912,0.908,0.903,0.898,0.891,0.885,0.877,
      =0.869,0.859,0.850,0.839,0.828,0.815,0.803,68*0.800
starticetkelvin=273.15
tau_thresh=0.01

```

```

[ namelist : run_convection ]
a_convect_seg_size=16
a_convect_segments=-99
adapt=7
amdet_fac=3.00
anv_opt=0
anvil_factor=1.0000
bl_cnv_mix=1
cape_bottom=5
cape_min=0.5
cape_timescale=3600
cape_top=50
cca2d_dp_opt=1
cca2d_md_opt=1
cca2d_sh_opt=1
cca_dp_knob=0.50
cca_md_knob=0.50
cca_min=2.000e-2
cca_sh_knob=0.50
ccw_dp_knob=0.00
ccw_for_precip_opt=4
ccw_md_knob=0.00
ccw_sh_knob=0.00
cld_life_opt=0
cldbase_opt_dp=3
cldbase_opt_md=3
cldbase_opt_sh=0
cnv_wat_load_opt=0
cvdiag_inv=0
cvdiag_sh_wtest=0.020
dd_opt=1
deep_cmt_opt=5
dil_plume_water_load=0
ent_dp_power=1.00
ent_fac_dp=1.13
ent_fac_md=0.90
ent_opt_dp=3
ent_opt_md=0
fac_qsat=0.500
fixed_cld_life=7200.00
i_convection_vn=5
iconv_congestus=0
iconv_deep=1
iconv_mid=1
iconv_shallow=1
icvdiag=1
l_3d_cca=.true.
l_anvil=.true.
l_ccrad=.true.
l_cloud_deep=.true.
l_conv_hist=.false.
l_cv_conserve_check=.false.
l_eman_dd=.false.
l_mom=.true.
l_mom_dd=.false.

```

```

l_murk_conv=.false.
l_new_dd=.false.
l_param_conv=.true.
l_re diagnosis=.false.
l_safe_conv=.true.
l_snow_rain=.false.
limit_pert_opt=2
mid_cmt_opt=0
mid_cnv_pmin=10000.00
mparwtr=1.5000e-3
n_conv_calls=2
plume_water_load=0
qlmin=3.0000e-4
qstice=3.5000e-3
r_det=0.9000
rad_cloud_decay_opt=2
sh_pert_opt=1
t_melt_snow=274.15
termconv=1
tice=263.1500
tower_factor=1.0000
tv1_sd_opt=2
ud_factor=1.0000
w_cape_limit=0.3

[namelist:run_cosp]
cosp_cloudsat_sim=.false.
cosp_isccp_sim=.true.
cosp_lidar_sim=.true.
cosp_misr_sim=.false.
cosp_modis_sim=.false.
cosp_rttov_sim=.false.
cosp_use_vgrid=.true.
l_cosp=.true.

[namelist:run_diffusion]
adjust_theta_end=85
adjust_theta_start=51
diag_interval=1
first_norm_print=1
hdiffopt=0
horizontal_level=0
l_adjust_theta=.true.
l_diag_l2helm=.false.
l_diag_l2norms=.false.
l_diag_noise=.false.
l_diag_print=.true.
l_diag_print_ops=.false.
l_diag_wind=.false.
l_flush6=.true.
l_pofil_hadgem2=.false.
l_print_div=.false.
l_print_lapse=.false.
l_print_max_wind=.false.
l_print_pe=.false.
l_print_shear=.false.
l_print_theta1=.true.
l_print_w=.false.
l_print_wmax=.true.
l_qpos=.true.
l_qpos_diag_pr=.false.
l_sponge=.false.
l_tardiff_q=.false.

```

```

l_vdiff_uv=.false.
norm_lev_end=85
norm_lev_start=1
pofil_opt=0
print_step=1
q_pos_method=4
q_pos_tracer_method=4
qlimit=1.000e-8
qpos_diag_limit=0
vdiffopt=0
w_print_limit=0

[namelist:run_dust]
dust_veg_emiss=1
horiz_d=2.50
i_dust=1
l_dust_div1_lbc=.false.
l_dust_div2_lbc=.false.
l_dust_div3_lbc=.false.
l_dust_div4_lbc=.false.
l_dust_div5_lbc=.false.
l_dust_div6_lbc=.false.
l_fix_size_dist=.false.
l_twobin_dust=.false.
sm_corr=0.50
us_am=1.45

[namelist:run_dyn]
alpha_relax_type=4
damp_height=80000.0
eg_vert_damp_coeff=0.05
eg_vert_damp_profile=4
eta_s=0.5
gcr_max_iterations=200
gcr_precon_option=4
gcr_tol=1.000e-3
horiz_viscosity=0.0
intrand_seed=0
l_check_moist_inc=.false.
l_endgame=.true.
l_fix_mass=.true.
l_mix_ratio=.true.
l_sl_bc_correction=.false.
l_viscosity=.false.
vert_viscosity=0.0

[namelist:run_dyntest]
gcr_diagnostics=1
gcr_its_avg_step=12,24,1440
l_backwards=.false.
l_dry=.false.
l_dynamics_only=.false.
l_exclude_physics2=.false.
l_hydrostatic_eg=.false.
l_idealised_data=.false.
l_perturb_ic_theta=.false.
l_trap_theta=.false.
l_trap_uv=.false.
l_trap_w=.false.
problem_number=0
trap_option=0

[namelist:run_electric]

```

```
[namelist:run_eng_corr]
a_energyhours=24
l_emcorr=.true.
lemq_print=.true.
lmass_corr=.false.
```

```
[namelist:run_free_tracers]
l_free_tracer=.false.
```

```
[namelist:run_gwd]
fbcd=4.00
gsharp=0.50
gwd_frc=4.00
gwd_fsat=0.25
i_gwd_vn=5
l_gw_heating=.false.
l_gwd=.true.
l_smooth=.true.
l_use_ussp=.true.
l_ussp_opaque=.true.
nsigma=2.5
ussp_launch_factor=1.2000
```

```
[namelist:run_murk]
l_murk=.false.
```

```
[namelist:run_nudging]
l_nudging=.false.
```

```
[namelist:run_ozone]
zon_av_ozone=.true.
```

```
[namelist:run_precip]
ai=1.8500e-2
aic=1.8500e-2
ar=1.00
arc=1.00
bi=1.9000
bic=1.9000
i_mcr_iter=1
l_autoc_3b=.false.
l_autoconv_murk=.false.
l_cry_agg_dep=.false.
l_droplet_tpr=.false.
l_hallett_mossop=.false.
l_it_melting=.false.
l_mcr_arcl=.false.
l_mcr_qgraup=.false.
l_mcr_qrain=.true.
l_psd=.false.
l_rain=.true.
l_rainfall_as=.true.
l_shape_rime=.false.
l_subgrid_qcl_mp=.false.
l_use_bmass_autoconv=.true.
l_use_ocff_autoconv=.true.
l_use_seasalt_autoconv=.true.
l_use_sulphate_autoconv=.true.
l_warm_new=.false.
lsp_eic=6.049000e-2
lsp_fic=8.3100e-1
niters_mp=10
```

```

precip_segment_size=32
tnuc=-10.00
x1r=2.2000e-1
x2r=2.2000

[ namelist : run_radiation ]
a_lw_seg_size=16
a_sw_seg_size=16
aero_bl_levels=50
aeroscl_csk_clim=5*1.0000
c113mmr=0
c114mmr=0
c11mmr=0
c12mmr=0
ch4mmr=0
co2_mmr=5.24100e-4
cusack_aero=2
dp_corr_conv=0
dp_corr_strat=10000.000
h_lwbands=9
h_swbands=6
hfc22mmr=0
hfc125mmr=0.0
hfc134mmr=0
i_cloud_representation=2
i_fsd=0
i_inhom=2
i_lw_radstep_perday_prog=24
i_overlap=3
i_ozone_int=2
i_rad_extra_call=0
i_rad_topography=2
i_sw_radstep_perday_prog=24
inhom_cloud_lw=0
inhom_cloud_sw=0
is_ncol=0
l_bs1999_abundances=.false.
l_consistent_cdnc=.true.
l_fsd_eff_res=.false.
l_quad_t_coast=.true.
l_rad_deg=.false.
l_rad_snow_emis=.true.
l_rad_szacor=.true.
l_rad_use_clim_volc=.false.
l_radiation=.true.
l_sec_var=.false.
l_t_bdy_surf=.false.
l_t_land_nosnow=.true.
l_t_rad_solid=.true.
l_use_arclbiom=.false.
l_use_arclblk=.false.
l_use_arcldelta=.false.
l_use_arcl dust=.false.
l_use_arclocff=.false.
l_use_arclsslt=.false.
l_use_arclsulp=.false.
l_use_biogenic=.true.
l_use_bmass_direct=.true.
l_use_cariolle=.false.
l_use_dust=.true.
l_use_nitrate_direct=.false.
l_use_ocff_direct=.true.
l_use_seasalt_direct=.true.

```

```

l_use_soot_direct=.true.
l_use_sulpc_direct=.true.
n2ommr=0
o2ommr=0.2314
rad_mcica_sampling=2
rad_mcica_sigma=0.750
two_d_fsd_factor=1.414

[namelist:run_rivers]
i_river_vn=1
l_inland=.true.
l_rivers=.true.
river_mcoef=1.400000
river_step=10800
river_vel=0.400000

[namelist:run_sl]
depart_order=2
high_order_scheme=8,7,1,1,7
instability_diagnostics=0
interp_vertical_search_tol=22
l_conserve_tracers=.true.
l_priestley_correct_moist=.false.
l_priestley_correct_thetav=.false.
l_priestley_correct_tracers=.false.
moisture_conservation=1
monotone_scheme=1,1,0,0,1
ritchie_high_order_scheme=0
ritchie_monotone_scheme=1
thmono_height=5.00000e+2

[namelist:run_stochastic]
i_pert_theta=0
l_rp2=.false.
l_skeb2=.false.
l_spt=.false.
l_stphseed_file=.false.
l_x_eq_sin_x=.true.
stph_n2=144
stphseed=0

[namelist:run_track]
l_hoskins=.true.
nbot_850=6
nlevs_avg=3
ntop_850=42
ntop_tc=63
sm=0.1

[namelist:run_ukca]
i_ukca_chem=0
i_ukca_conserve_method=2
i_ukca_hiorder_scheme=0
l_ukca=.true.
l_ukca_ageair=.true.
l_ukca_asad_plev=.false.
l_ukca_chem_plev=.false.
l_ukca_src_in_conservation=.true.

[namelist:temp_fixes]
l_dtcanfix=.false.
l_eg_damp_height_lid=.false.
l_emis_ssi_full=.true.

```



```
l_fail_p_layers_inconsis=.true.  
l_fix_arcl_eg_levs=.false.  
l_fix_conserv=.false.  
l_fix_drop_settle=.false.  
l_fix_mphys_diags_iter=.false.  
l_glue_conv5a=.false.  
l_iau_pc2check=.true.  
l_ignore_error_ancil_struct=.false.  
l_methox_fix=.false.  
l_mphys_gr_out=.true.  
l_pc2_homog_turb_q_neg=.false.  
l_rm_hardwire_gas360=.true.  
l_rm_neg_par=.true.  
l_roughnesslength_fix=.false.  
l_stph_rhcrit_unbias=.false.
```

```
[namelist:urban2t_param]
```

```
[namelist:urban_switches]  
l_moruses_albedo=.false.  
l_moruses_emissivity=.false.  
l_moruses_rough=.false.  
l_moruses_storage=.false.  
l_moruses_storage_thin=.false.  
l_urban2t=.false.
```

```
[namelist:vertical]  
v_int_order=2
```