

Wikiprint Book

Title: 1. IPSL-CM5A2 model

Subject: Igcmg_doc - Doc/Config/IPSLCM5A2

Version: 57

Date: 05/25/20 17:20:10

Table of Content

IPSL-CM5A2-VLR configuration	3
1. IPSL-CM5A2 model	3
2. Technical details	3
2.0.1. How to use it	4
2.0.2. Restart files	4
2.0.3. Output level	4
2.0.4. Lengths, frequencies	4
2.0.4.1. Period length	4
2.0.4.2. Pack Frequency	5
2.0.4.3. Rebuild frequency	5
2.0.5. Computing centres	5
2.0.5.1. IDRIS Ada features	5
3. Tuning and evaluation of the model	6


```

#-H- IPSLCM5A2.1 IPSLCM5A2.1 coupled configuration
#-H- IPSLCM5A2.1 2nd frozen IPSLCM5A2 version
#-H- IPSLCM5A2.1 NEMOGCM branch nemo_v3_6_STABLE revision 6665
#-H- IPSLCM5A2.1 XIOS2 trunk revision 965
#-H- IPSLCM5A2.1 IOIPSL/src svn tags/v2_2_2
#-H- IPSLCM5A2.1 LMDZ5 trunk rev 2621
#-H- IPSLCM5A2.1 ORCHIDEE version trunk rev 3930
#-H- IPSLCM5A2.1 OASIS3-MCT 2.0_branch rev 1818
#-H- IPSLCM5A2.1 IPSLCM5A2 svn
#-H- IPSLCM5A2.1 libIGCM trunk rev 1373
#-M- IPSLCM5A2.1 arnaud.caubel@lsce.ipsl.fr
#-C- IPSLCM5A2.1 IOIPSL/tags/v2_2_2/src HEAD 8 IOIPSL/src modeles
#-C- IPSLCM5A2.1 trunk/ORCHIDEE 3930 14 ORCHIDEE modeles
#-C- IPSLCM5A2.1 branches/OASIS3-MCT_2.0_branch/oasis3-mct 1818 15 oasis3-mct .
#-C- IPSLCM5A2.1 LMDZ5/trunk 2621 11 LMDZ modeles
#-C- IPSLCM5A2.1 CONFIG/UNIFORM/v6/IPSLCM5A2 HEAD 8 IPSLCM5A2 config
#-C- IPSLCM5A2.1 trunk/libIGCM 1373 10 libIGCM .
#-C- IPSLCM5A2.1 branches/2015/nemo_v3_6_STABLE/NEMOGCM 6665 7 . modeles
#-C- IPSLCM5A2.1 XIOS/trunk 965 12 XIOS modeles

```

Note that previous IPSLCM5A2.0 release (with bug in runoff conservation) is still available.

2.0.1. How to use it

Here are the commands you need to know if you want to retrieve and compile the IPSL-CM5A2 model and if you want to setup and run a piControl experiment (pdControl is also available):

```

mkdir YOUR_DIRECTORY ; cd YOUR_DIRECTORY
svn_ano # svn co http://forge.ipsl.jussieu.fr/igcmg/svn/modipsl/trunk modipsl
cd modipsl/util
./model IPSLCM5A2.1
cd ../config/IPSLCM5A2
gmake # by default ORCA2xLMD9695-L39
cp EXPERIMENTS/IPSLCM/piControl/config.card .
vi config.card # modify JobName (at least) : MYJOBNAME, restarts
../../libIGCM/ins_job # Check and complete job's header
cd MYJOBNAME
vi Job_MYJOBNAME # modify PeriodNb, adjust the time, headers ...
llsubmit Job_MYJOBNAME # IDRIS
ccc_msub Job_MYJOBNAME # TGCC

```

2.0.2. Restart files

Default IPSL-CM5A2-VLR configuration starts from **CM5A2.1.pi.00** simulation at the date of **4049-12-31**. The monitoring of this simulation is available here : <http://esgf.extra.cea.fr/thredds/fileServer/work/p25sepu/IPSLCM5A2/PROD/piControl/CM5A2.1.pi.00/MONITORING/index.html>

2.0.3. Output level

By default, **low output levels** are activated : monthly and daily outputs for atmospheric component, monthly and/or yearly outputs for other components. Remind that you have to think of the output you need before launching a long simulation.

2.0.4. Lengths, frequencies

2.0.4.1. Period length

Default period length is 1Y, i.e in config.card :

```
PeriodLength=1Y
```

Note that clean_PeriodLenght.job will remove last period files, i.e last simulated year files.

2.0.4.2. Pack Frequency

Default pack frequency is 10Y, i.e in config.card :

```
PackFrequency=10Y
```

Note that since clean_latestPackperiod.job works on the latest pack period, clean_latestPackperiod.job will remove files from latest 10Y pack period. clean_latestPackperiod.job can also be used several time in a row to delete several 10Y pack periods.

2.0.4.3. Rebuild frequency

Since we run with XIOS (server mode) as output library, **the rebuild step is not needed anymore.**

2.0.5. Computing centres

The basic configuration (default configuration) runs on Curie TGCC and Ada IDRIS machine and uses 302 computing cores : 1 process for XIOS, 45 processes for NEMO, and 32 MPI processes and 8 OpenMP thread for LMDZ. This configuration allows you to run 56 simulated years per day. In order to use less computing resources, it is possible to run on 160 cores (38 simulated years per day) as follows : 1 process for XIOS, 31 processes for NEMO, and 32 MPI processes and 4 OpenMP thread for LMDZ. To do that, you have to :

- Modify config.card as follows :

```
#=====
#D-- Executable -
[Executable]
#D- For each component, Real name of executable, Name of executable for oasis
ATM= (gcm.e, lmdz.x, 32MPI, 4OMP)
SRF= ( " " , " " )
SBG= ( " " , " " )
OCE= (opa, opa.xx, 31MPI)
ICE= ( " " , " " )
MBG= ( " " , " " )
CPL= ( " " , " " )
IOS= (xios_server.exe, xios.x, 1MPI)
```

- create the new job :

```
../../libIGCM/ins_job
```

- Modify PARAM/namelist_ORCA2_cfg

```
  jpni      = 1      ! jpni  number of processors following i (set automatically if < 1)
  jpnj      = 31     ! jpnj  number of processors following j (set automatically if < 1)
  jpnij     = 31     ! jpnij number of local domains (set automatically if < 1)
```

- submit the job : ccc_msub (or lsubmit) Job_MYJOBNAME

Because of load-balancing (difference between ocean computing time and atmosphere computing time), not all of the configurations (in terms of number of process/threads) are efficient. If you want to run a configuration with less cores, ask Arnaud Caubel what would be the optimum configuration.

2.0.5.1. IDRIS Ada features

The basic configuration (default configuration) runs on Ada (IDRIS). In order to use efficiently computing resources, you have to use Intel environment. To do that you have to :

- ask IDRIS assistance (mail to assist@...) to be authorized to use Ada full node and (# @ node = N) option.
- specify the environment you want to use when you do the ../../libIGCM/ins_job command as follows :

```
Hit Enter or give MPI Environment (default is IBM), possible MPI environments are IBM (MPI IBM) and Intel (MPI Intel)
Intel
MPIEnvironment is Intel
```

3. Tuning and evaluation of the model

A **note** is being written on the tuning strategy of IPSL-CM5A2. The following pdf document is updated very frequently: [IPSL-CM5A2 : Set-up, tuning strategy and evaluation](#)

CliMAF atlases comparing IPSL-CM5A2 and IPSL-CM5A pre-industrial climatologies will soon be available here :

http://esgf.extra.cea.fr/thredds/fileServer/work/p25sepul/C-ESM-EP_CM5A2.1_vs_CM5A_vs_data.html]

Intermonitoring (i.e. evolution in time of the main variables of model components) between IPSL-CM5A2.1 and IPSL-CM5A :

http://esgf.extra.cea.fr/thredds/fileServer/work/p25sepul/intermonito_CM5A2_CM5A/index.html

Legend to read this intermonitoring :

Blue curve : IPSL-CM5A-LR

Red Curve : IPSL-CM5A2.1 initial run, before tuning, starting from climatologies

Green+Yellow curves : IPSL-CM5A2.1 after tuning, branched at year 620 of CM5A2.1 initial run.

Total run length after tuning: 1600 years.

Total run length from climatologies : 2220 years.