Institut Pierre Simon Laplace

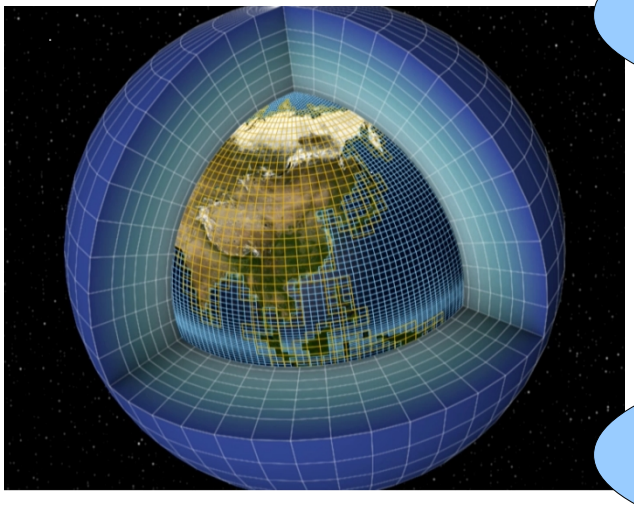
IPSL Climate Modelling Centre

IPSL-CM Model

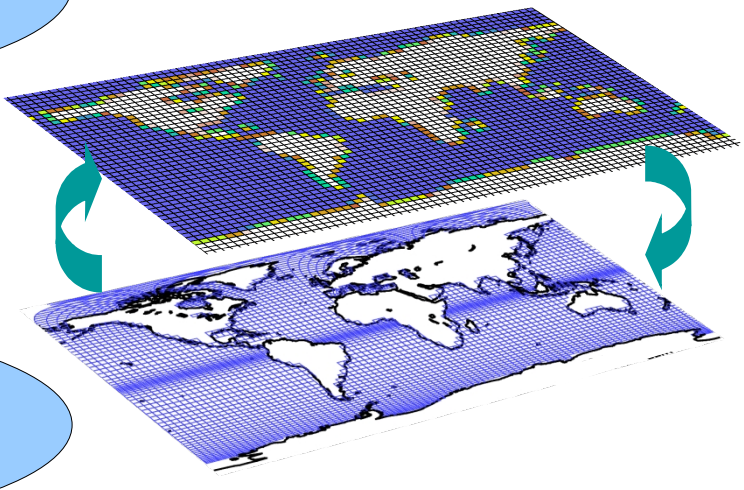
chemistry & aerosols
INCA / REPROBUS

Land and vegetation
ORCHIDEE

Atmospheric physics
LMDZ



coupler
OASIS



Oceanic physics
OPA

NEMO

biogeochmistry
PISCES

Sea Ice
LIM

IPSL-CM6 Model

Improved version of IPSL-CM5B used in CMIP5

Two resolutions:

- **LR** : Atm: 2.5x1.5° (144x144) L79 Oce: 1° L75
- **HR** : Atm: 1.3x0.6° (280x280) L79 Oce: 0.25° L75

Total model years: between 10 000 and 20 000 years

Configurations;

- standard: physical + carbon cycle + prescribed aerosol and ozone
- standard but interactive aerosol
- standard but interactive aerosol and chemistry (only LR)

• Some simulations with both **prescribed** and **interactive** aerosol and chemistry

Some Gaps in CMIP5

- Lack of RF estimates
- Lack of uncoupled simulation of individual components for ocean and land surface (like AMIP for the atmosphere)
- Not enough members and/or insufficient length of runs to have good enough signal/noise ratio for some studies (variability, extremes, regional changes, etc.)
- How to « flag » models that are of the same « family »? (number of « independent » models)

CMIP6 design

- Agree on the proposed design
  - DECK+ : minimum set for continuity of model characteristics
  - “CORE” (High priority runs to address key questions):
    - Tier 1 of endorsed MIP (does not mean all models have to do it)
    - CMIP panel may propose missing key experiments, if any ?
  - Importance of modelling centre being involved in the definition process of MIPs
  - As a modelling centre “Deck+Core” < 30% of the total number of simulated years
- Strong interest in common forcings (both emission and concentration) for aerosol, atmospheric composition and external forcing (volcanoes, solar)

CMIP6 design : suggestions or comments

- Start AMIP run in 1950 (cheap) + ensemble (less cheap)
- Nudged AMIP
- Various family of historical runs (with all forcings):
  - Concentration vs emission CO2
  - Interactive vs prescribed aerosol and chemistry (+volcanoes)
- Possible of focussed (i.e. partial) contribution to Tier 1 (Paléo, decadal projections)?
- Some guidance to help choosing the *number of members, number of experiments* (resolution)
  - for *sensitivity experiments*, especially when focussing on *regional scales*

    expected difference > “noise” due to variability

    Provided by the MIP

  - Resolution vs number of members (?)

CMIP6 outputs

- Priority level for the output (may depend on period, member number...)
- A digital (i.e. that can be read by a program) of the variable lists, the output periods, their eventual priority, etc. for each MIP
- “Light” quality check tool for the output data files

IPSL current plan

Short name of MIP	IPSL-ESM France	Level of involvement	comment
AerChemMIP	1	medium	subset
C4MIP	1	high	
CFMIP	1	high	
DAMIP	2		
DCPP	1	focussed	component C
GeoMIP	1	medium	
ISMIP6	1	focussed	Greennland
LS3MIP	1	high	
LUMIP	2	limited	
OCMIP6	1	Tier 1	
PMIP	1	high	
RFMIP	1	medium	
ScenarioMIP	1	Tier 1	
VolMIP	1	medium	subset