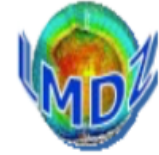


LMDZ Tutorial 2 Presentation



Tutorial 2 has a mandatory part and then a choice of exercises.
Should be a starting point for discussion of your particular projects ...

Mandatory part :

https://lmdz.lmd.jussieu.fr/pub/Training/Tutorials/Tutorial_2.pdf

explains how to setup your own experiment, create start files and boundary files, setup a zoom, ...

Exercises :

Choice of : 1D, nudging, aerosols, tracers, ORCHIDEE, parallel, XIOS

Setting up a simulation : prerequisites

A) Download and compile model(s) and IO libraries

A.1) Download LMDZ (+ models coupled to LMDZ) + IO libraries (**IOIPSL**, **XIOS**)

in a dedicated folder : usually *modipsl/modeles*

A.2) Compile the IO libraries once, in the beginning

A.3) Compile the model(s) with the options of your choice:

IO treatment, parallel/sequential mode, resolution, radiative code...) => **gcm.e**

B) Get/create initial and boundary files **start*.nc** and **limit.nc** for **YOUR** grid (**grid=resolution + zoom parameters**)

- generally available for regular grids at standard resolutions,

- to be produced for non-standard grids by compiling and running **ce0l.e**

C) Get forcing files

some need **interpolation on YOUR grid** (Ex : aerosols, ozone...)

some others don't (Ex : GHG=global means)

D) Get additional files if needed : ex. : for nudging

(and guess what...?) **interpolate them on YOUR grid !**

Setting up a simulation : general steps

1) Create a simulation folder

(in LMDZ training they are automatically created for you :
BENCH or TUTORIAL/SIMU1*)

2) Copy in it (or create links to) :

- > *.def files, executable(s), scripts for postprocessing
- > start*.nc and limit.nc for the chosen grid (resolution, zoom if any):
- > gcm.e
- > other files for forcing, nudging (for the chosen grid)...

3) Set your desired flags¶meters (other than zoom ones !) in *.def files

4) Run the model (and the post-processing scripts if needed)

For a different simulation :

- with the same gcm.e and grid (resolution, zoom) : redo **Steps 1 to 4**

- with different resolution/zoom parameters:
 - recreate **start*** and **limit** (cf **prerequisites B**)
 - reinterpolate all files grid-dependent (**prerequisites C,D**)

- after code changes: recompile cf (**prerequisites A3**) => **new gcm.e**

Steps for setting up a simulation using “all-in-one” **tutorial.tar**

(see : https://lmdz.lmd.jussieu.fr/pub/Training/Tutorials/Tutorial_2.pdf)

Prerequisite : **install_lmdz.sh** has **automatically**

- downloaded and compiled model(s)&libraries,
- run a 1st simulation in modipsl/models/LMDZ/BENCH32x32x39

Here : **tutorial.tar** via its main script **init.sh** allows you to **automatically** :

- recompile LMDZ for a different resolution
- create initial and boundary files (start* and limit) for a chosen grid
(NOTE : *grid = resolution+zoom factor*)
- set up simulation folders : SIMU1 (multi-day runs), PROD0 (multi-month runs)
with all you need (*.def files, start* and limit.nc files, gcm.e)

You'll “only” have to : -

- a) Download and unpack tutorial.tar in modeles/LMDZ => folder TUTORIAL
- b) Check/modify *.def files in TUTORIAL/DEF/ (zoom parameters are in **gcm.def**)
- c) Check/modify **init.sh** script : **grid_resolution, veget, parallel**
- d) run : **./init.sh** (NOTE : pay attention at its final instructions about how to run the model)
- e) check the results of **./init.sh** :
 - TUTORIAL/INITIAL : grille.pdf, start.nc, startphy.nc and limit.nc
 - TUTORIAL/SIMU1 : check *def files and links to gcm.e and start+limit.nc files

And finally :

- f) **run the model and visualize the results**

Proposed exercises :**Nudging****1D****Parallelism****XIOS****Coupling with surface schemes (**b**ucket, **O**rchidee)****Aerosols****Tracers**

Download your choice(s) from :

<https://lmdz.lmd.jussieu.fr/pub/Training/Tutorials>