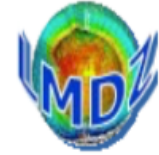


# LMDZ Tutorial 2 Presentation



**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](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, ...)

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&parameters (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](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 1<sup>st</sup> 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>