Training Course : Real case

MesoNH Tutorial Class 1-4 December 2025

Presentation

> **Objectives :**
> - ▶ run a MESONH simulation in real case
> - ▶ understand the different steps with 1 or 2 models
> - ▶ discover and modify the namelists

<u>Please :</u>
Modify only what is asked in the namelists

Preparation

cd ∼/MNH-V5-7-1/MY_RUN/KTEST
mkdir TP_CAS_REEL
cd TP_CAS_REEL
tar xvf ∼rodierq/tp_real_makefile.tar
export PREP_PGD_FILES=∼rodierq/PREP_PGD_FILES_WWW

For each new working terminal

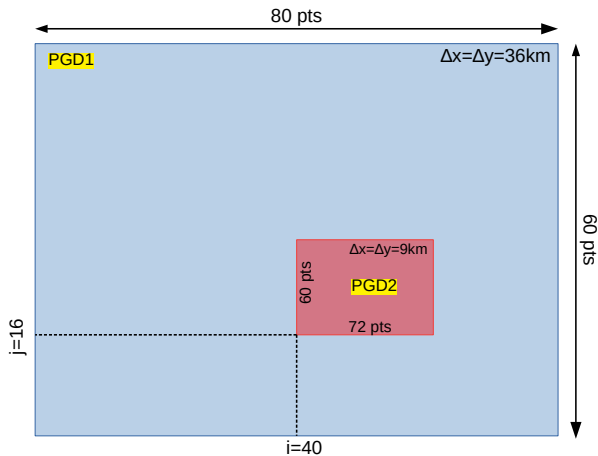Load the profile :
source ∼/MNH-V5-7-1/conf/profile_mesonh-LXgfortran-R8I4-
MNH-V5-7-1-MPIAUTO-DEBUG

Creation of all the PDG files

1. In the directory `001_pgd1`, run the step PREP_PGD to create the **dad**'s PGD file named **PGD_36km** with :
   - a domain with 80 points in x-direction and 60 in y-direction
   - a mesh of 36 km in x and y
2. In the directory `002_pgd2`, run the step PREP_PGD to create the **son**'s PGD file named **PGD_9km** with :
   - a domain with 72 points in x-direction and 60 in y-direction (number of points for the son's domain)
   - a mesh of 9 km in x and y
   - which start at point i=40,j=16 from dad's domain
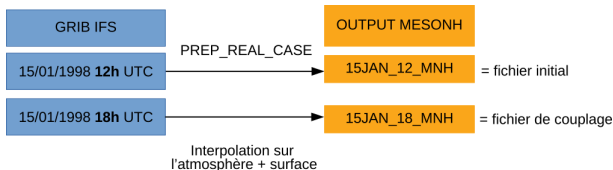3. In the directory `003_nest`, run the step PREP_NEST_PGD

Creation of all the PGD files

Preparation of coupling files

The extraction of GRIB files is already done with extractecmwf. The files are in the directory 004_prep_real

1. in the directory 004_prep_real run the step PREP_REAL_CASE to make the inital file for dad's domain from the atmospheric file **ecmwf.EI.19980115.12** named **15JAN_12_MNH**

2. run the step PREP_REAL_CASE to make the coupling file for dad's domain from the atmospheric file **ecmwf.EI.19980115.18** named **15JAN_18_MNH**

Segment 1

We will now run the simulation with only one domain between 12h and 13h with a coupling file at 18h.

1. In the directory 005_run1 , modify the namelist in order to have :
   - ▶ 1 domain
   - ▶ 1 hour of simulation
   - ▶ 4 output files (every 15 minutes)
   - ▶ a time step of 100 s
   - ▶ the output files must be named : **16J36.1.SEG01.00n**
2. Run the MESONH simulation

Segment 2

1. In the directory 005_run1 , modify the namelist in order to restart the simulation for 1 hour. The output files must be named : **16J36.1.SEG02.00n**

2. Run the MESONH simulation

Segment 3

We will now run a simulation with the 2 domains between 14h and 15h.
We first create the initial file for son's domain.

1. In the directory `006_spa_mod1_mod2`, run the step SPAWNING (modify the namelist) to make the horizontal interpolation from the dad's domain to the child's domain at 14h (end of segment 2)

2. In the directory `007_preal`, modify the namelist in order to create the son's initial file named **15JAN_14_MNH2** (vertical interpolation after SPAWNING)

Segment 3

3. In the directory 008_run2 , modify the namelist in order to have :
   - ▶ 2 domains
   - ▶ 1 hour of simulation
   - ▶ 2 output files (every 30 minutes) for each domain
   - ▶ a time step of 100 seconds for the father and a ratio of 4 for the son
   - ▶ two-way interaction
   - ▶ the output files must be named : **16J36.1.SEG03.00n**
4. Run the MESONH simulation
5. In the directory 009_diag , run the step DIAG on the files you want and plot some figures in 010_python

Bonus

If you have finished early, here are some harder exercices.

3 domains

- ▶ add a 3rd domain located at the top-left of PGD1 with a 18km resolution (choose the domain size)
- ▶ run a simulation with the 3 domains for 2 hours starting at 12 UTC the 15/01/1998 with a frequency output of 1 hour.

Run domain 3 alone

- ▶ run a simulation with the domain 3 alone (coupled with domain 1 without grid-nesting) starting from the result of the previous simulation at **13** UTC the 15/01/1998 for one hour long