Using FlexPart For Modelling GHGs

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Required files

- ERA Interim data or GFS 3-hourly meteo data
- fp_exercise_src.tar.gz, fp_settings_short.tar.gz, OH_variables.bin
- SETTINGS file (for calc_conc) – save in src directory

Start FLEXPART

Flexpart simulation for the Finnish station Pallas:

1) Make a directory called “GHG” in your user exercises directory
2) Copy the 3 tar files (fp_exercise_src.tar.gz, fp_settings_short.tar.gz, OH_variables.bin) to your GHG directory and “untar” them
3) Optional (to distinguish from FLEXPART “src”):
   `mv src src_ghg`
4) In PAL, there is an options directory. Change in the COMMAND file the path to the OH_fields, for example to:
   `/../../../`
5) Copy “pathnames” to your GHG directory and adjust.
6) OPTIONAL FOR A SHORT RUN(about 40 min):
   Edit RELEASES: delete from line 1157 to the end – can use:
   sed -i.bak -e ‘1157,$d’ RELEASES
   Edit COMMAND “IEDATE = 20140604”
7) Link the FLEXPART executable to your directory and start it

The exercise

Simulate 8 days of CH_4 mixing ratio at the Finnish station Pallas and compare with observations

1) Run FlexPart using given files in options folder to generate *grid_time* and *grid_initial* files (you've already started this!)
2) Run *calc_conc* to:
   - read the *grid_time* and *grid_initial* files
   - read the prior emissions field
   - read the initial concentration field
   - calculate the mixing ratios
3) Plot the modelled and observed mixing ratios

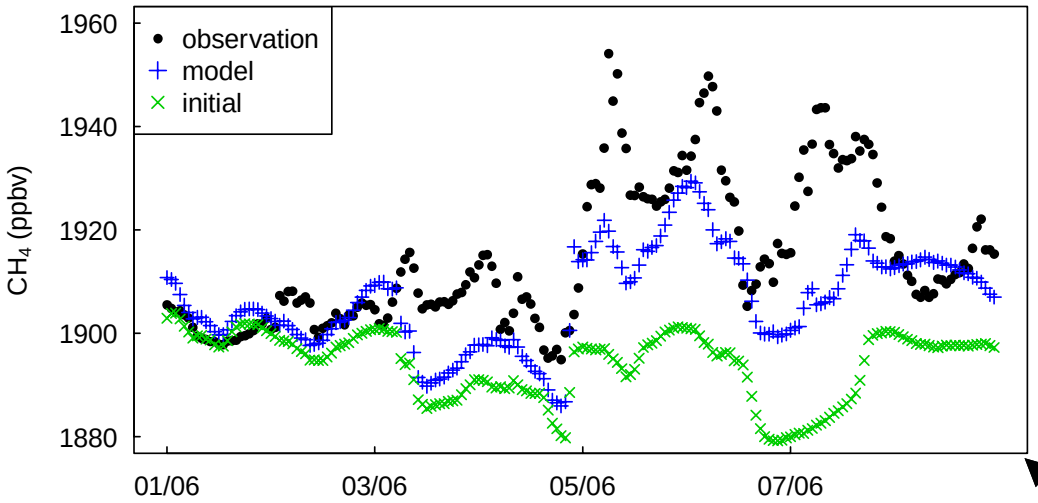
Running calc_conc

1) Edit the SETTINGS file for input paths and files
2) Compile the code using “make”
3) Execute using e.g. nohup ./calc_conc SETTINGS > out.log &

Results

Methane mixing ratios at Pallas, northern Finland

Timeseries of 8 days 1-8 June 2014



My longer run of 2 months June-July 2014