

# Exercises

## EMEP Open Source Training Course

### 13 October 2008

1. Set up a model run:
  - on 6 processors
  - for the period 1–5 July 2005
  - for an area covering France, United Kingdom and Spain.

Check that your results are reasonable by looking at them using *ncview* on Stallo. In order to see country borders in *ncview*, you might choose the `~/EMEP_map_boundaries` file, which is in your home directory, as your custom defined overlay in the options (Opts).

**Hint:** Find a map over the  $50 \times 50$  km<sup>2</sup> official EMEP grid on <http://www.emep.int/grid/index.html>, and define the run domain using the map. Remember that the official EMEP domain does not correspond to the standard model domain!

2. Use your previous setup. In addition to the standard output, write out surface CO values and SO<sub>4</sub><sup>2-</sup> values for all vertical levels (i.e. in 3 dimensions) to the daily netCDF output file.
3. Visualize the effect of a 15% reduction in NO<sub>x</sub> traffic emissions in Germany in the period 1–5 July on the EMEP area.

**Hint:** Run the model for the whole EMEP area using all emissions. Then, perform a scenario run where you reduce NO<sub>x</sub> traffic emissions (SNAP sector 7) in Germany by 15%. For this you can use the `femis.dat` file. Country codes can be found at <http://www.emep.int/grid/index.html>. Find the effect of a 15% reduction by taking the difference between the first and second run with *ncdiff* (`ncdiff -v WDEP_OXN -o newfile.nc Base_fullrun1.nc Base_fullrun2.nc`). The result you can look at with *ncview*.

4. In addition to the standard output, write out SO<sub>2</sub> concentrations for all vertical levels for every second hour to the “sondes” output. The locations should be Oslo and Milan.

**Hint:** The geographical coordinates of Oslo and Milan are 59° 56' North, 10° 45' East and 45° 28' North, 9° 11' East, respectively. Use the program on <http://www.emep.int/grid/index.html> to convert to EMEP coordinates and convert then to model coordinates.