



## **Air quality high resolution simulations of Italian urban areas with WRF-CHIMERE**

Serena Falasca (1) and Gabriele Curci (2)

(1) Department of Physical and Chemical Sciences, University of L'Aquila, L'Aquila, Italy, (2) Centre of Excellence CETEMPS, Department of Physical and Chemical Sciences, University of L'Aquila, L'Aquila, Italy

The new European Directive on ambient air quality and cleaner air for Europe (2008/50/EC) encourages the use of modeling techniques to support the observations in the assessment and forecasting of air quality.

The modelling system based on the combination of the WRF meteorological model and the CHIMERE chemistry-transport model is used to perform simulations at high resolution over the main Italian cities (e.g. Milan, Rome). Three domains covering Europe, Italy and the urban areas are nested with a decreasing grid size up to 1 km. Numerical results are produced for a winter month and a summer month of the year 2010 and are validated using ground-based observations (e.g. from the European air quality database AirBase). A sensitivity study is performed using different physics options, domain resolution and grid ratio; different urban parameterization schemes are tested using also characteristic morphology parameters for the cities considered. A spatial reallocation of anthropogenic emissions derived from international (e.g. EMEP, TNO, HTAP) and national (e.g. CTN-ACE) emissions inventories and based on the land cover datasets (Global Land Cover Facility and GlobCover) and the OpenStreetMap tool is also included.

Preliminary results indicate that the introduction of the spatial redistribution at high-resolution allows a more realistic reproduction of the distribution of the emission flows and thus the concentrations of the pollutants, with significant advantages especially for the urban environments.