Daily Forecast of Air Quality over Europe with the EURAD Model System

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Regional and local air quality models have become an important tool for environmental research and application to environmental assessment and policy questions. On one hand it is important to use air quality models as a tool to understand the simulations carried out with them, and on the other side, evaluated, highly improved models should be used to forecast atmospheric pollutants in an operational state. Since summer 2001 a real-time forecast system based on the EURAD Model was tested and established to predict the main atmospheric pollutants on different scales in Europe, namely Europe, Central Europe and the German state Northrhine-Westfalia. The EURAD Air Quality Prediction System runs daily for 00 UTC in a non-hydrostatic mode with a forecast length of 72 hours. The results are updated and displayed on the EURAD web side (www.eurad.uni-koeln.de).

Every day, an extensive amount of data is produced by the EURAD Air Quality Prediction System. This includes the meteorological prediction variables and the concentrations of the atmospheric constituents at all model levels as well. In order to compare later especially the concentrations of air pollutants main effort was done to visualize the near surface concentrations of the main air pollutants O_3, NO_2, SO_2, CO and PM_{10} for the above mentioned domains. For assessment studies the ranges for the concentration thresholds were selected according to the EU directives. A combined air quality index is calculated to show the overall air pollution state at the different regions. Animated gifs of hourly and averaged concentrations and meteorological variables demonstrate the temporal evolution of a pollution event. Combined meteo-chemograms for selected regions in Europe and Germany display the interaction between meteorology and chemical constituents. An intensive model validation

was carried out to demonstrate the skill of the prediction system.

In future, is it planned to extend the prediction system with a new module to assimilate actual in situ data from ground observations and satellite data in order to increase the performance of the air quality forecast.