Geophysical Research Abstracts
Vol. 18, EGU2016-11942, 2016
EGU General Assembly 2016

CMAQ (Community Multi-Scale Air Quality) atmospheric distribution model adaptation to region of Hungary

Dóra Lázár and Tamás Weidinger

Department of Meteorology, Institute of Geography and Earth sciences, Eötvös Loránd University, Hungary (ldora1989@gmail.com)

For our days, it has become important to measure and predict the concentration of harmful atmospheric pollutants such as dust, aerosol particles of different size ranges, nitrogen compounds, and ozone. The Department of Meteorology at Eötvös Loránd University has been applying the WRF (Weather Research and Forecasting) model several years ago, which is suitable for weather forecasting tasks and provides input data for various environmental models (e.g. DNDC). By adapting the CMAQ (Community Multi-scale Air Quality) model we have designed a combined ambient air-meteorological model (WRF–CMAQ). In this research it is important to apply different emission databases and a background model describing the initial distribution of the pollutant. We used SMOKE (Sparse Matrix Operator Kernel Emissions) model for construction emission dataset from EMEP (European Monitoring and Evaluation Programme) inventories and GEOS-Chem model for initial and boundary conditions.

Our model settings were CMAQ CB05 (Carbon Bond 2005) chemical mechanism with 108 x 108 km, 36 x 36 km and 12 x 12 km grids for regions of Europe, the Carpathian Basin and Hungary respectively. i) The structure of the model system, ii) a case study for Carpathian Basin (an anticyclonic weather situation at 21th September 2012) are presented. iii) Verification of ozone forecast has been provided based on the measurements of background air pollution stations. iv) Effects of model attributes (f.e. transition time, emission dataset, parameterizations) for the ozone forecast in Hungary are also investigated.