Urban air quality forecast for the city of Budapest, Hungary

G. Baranka and K. Labancz

Hungarian Meteorological Service, Analysis of Air Quality, Budapest, Hungary (baranka.gy@met.hu)

The aim of this research is to develop a forecasting system producing enhanced maps of present and predicted concentrations of air pollutants in Budapest. In addition to the in-situ concentrations observed at a station, this tool will calculate the map of pollutant distribution using other monitored and calculated ambient air concentrations as well as predicted distributions calculated for one or two days using an integrated system of meteorological and dispersion models. The emissions of different primary pollutants from road transport in Budapest have been calculated using the European standard methodology. The emission model is based on emission factors of the well-known COPERT IV. The vehicles were grouped by category and by the emission of the vehicle's EURO standards. COPERT IV contains emission factors for each vehicle categories. The forecasting modelling system recently consists of a version of the MM5 meteorological model and the CHIMERE photochemistry transport model. Output of the CHIMERE dispersion model is the spatial distributions of the daily averages and maximum values that also determine whether or not standards are exceeded and to what degree. Otherwise calculated O3 values generally are in good agreement with measurements. The calculated values showed acceptable results compared to measured concentration, but further statistical evaluation is needed. The temporal variation of calculated O3 values is in good agreement with measurements, which proves that the photochemistry in the model works very well.

In course of this research project, the coupled emission-dispersion model system would be established, in which case it will be possible to improve urban air quality using traffic control strategies.