Description and preliminary results for an automated system for chemical weather forecasts over Bulgaria

Iglika Etropolska[1], Dimiter Syrakov[1], Kostadin Ganev[2], Maria Prodanova[1], Nikolai Miloshev[2], Georgi Jordanov[2], Kiril Slavov[1]

[1] National Institute of Meteorology and Hydrology, Sofia 1784, **Bulgaria**
[2] Geophysical Institute, Bulgarian Academy of Sciences, Sofia 1113, **Bulgaria**

In the current paper, we present a prototype of the Integrated Bulgarian System for Information and Chemical Weather Forecasting. It is intended to produce real time forecasts of the spatial/temporal deviation of atmospheric air quality over the entire country, as well as for specific regions chosen.

Currently the part responsible for the overall picture is designed and tested. It is based on the US EPA MODELS-3 system: MM5 as the meteorological model, SMOKE as an emission pre-processor and CMAQ as the chemical transportation model. Meteorological input to the system is taken from ALADIN – the large scale weather forecasting tool run in the Bulgarian National Institute of meteorology and Hydrology (NIMH). As an emission input we use EMEP inventory for the year 2000 which has a 50x50km resolution and more precisely a high-resolution subset produced by TNO, Netherlands. We intend to use the Bulgarian national emission inventory once it becomes available.

Boundary conditions are prepared in a similar system operational at the Aristotle University of Thessaloniki, Greece (AUTH). An interface software extracts the AUTH forecast and generates boundary conditions for our domain, then they are uploaded via internet on a server situated in NIMH, Sofia. Our system runs automatically two times a day, at 00h and 12h UTC and produces 48 hours forecast. The results from every run is manipulated to archive only the most important polluters. They are used to verify output data according to respective measurements. Part of the results are depicted as series of maps showing the air quality evolution over Bulgaria then they are sent to a specialized web server. Data for several polluters are made available to the public by publishing them on a web site as separate images, as well as animated sequences .

Here, we represent a description of the system and demonstrate a part of the results.