Vertical structure of the Atmospheric Boundary-Layer Simulation Over Sofia -
The Regional Atmospheric Modeling System RAMS and Sofia Experiment 2003

* , **Ekaterina Batchvarova, **Enrico Pisoni, **Giovanna Finzi

* National Institute of Meteorology and Hydrology, Sofia, Bulgaria,
** University of Brescia, Brescia, Italy

Abstract

Sofia (Bulgaria) has very high ground level concentrations of PM both in winter and summer, due to the high anthropogenic emissions and frequent stagnant meteorological conditions that characterize this area. So it is important to use deterministic Air Quality Modeling Systems, in order to evaluate the impact of different air quality control policies on air pollution concentrations. Air Quality Modeling Systems integrate chemical transport models, emission models, meteorological models and initial and boundary condition processors. Meteorological models are core modules of these Systems and, due to their complexity, require high computational costs to perform simulations.

This paper presents the results obtained in the frame of the HPC-EUROPA (Pan-European Research Infrastructure on High Performance Computing) cooperation project. The meteorological fields over Sofia have been simulated using RAMS (Regional Atmospheric Modeling System) through parallel computing. The meteorological simulations have been calculated considering different RAMS model versions, nested grid configuration and spatial resolutions. The evaluation of the model results is then performed against boundary-layer experimental measurements, using radio-sounding and surface data collected in the area from September to October 2003. Such evaluation, considering different model configurations, is performed for the first time over Sofia and Bulgaria.