



Possibilities of short-term forecast of air pollutants' concentrations over the Moscow region

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Assessment of atmospheric air quality is an extremely important task which has the greatest significance in the Megacities. The ecological situation in cities is complicated by the fact that they are the largest sources of pollutants. The concentration of gaseous and aerosols in the atmosphere, their transformation and transport from the source depends on weather conditions. At the same time, the atmospheric parameters such as temperature, humidity and precipitation are connected with the chemical composition of air. Thus, the meteorological regime of the atmosphere must be taken into account for prediction of air pollutants concentrations. Nowadays the main tools for short-term forecast of air pollutants' concentrations are numerical models.

COSMO_ART model have been used to predict the air pollutants' concentration over the Moscow region. This is chemical-transport model which consists of meso-scale nonhydrostatic meteorological model (COSMO) and model system describing chemical processes in the atmosphere (ART).

It is known that the quality of the model results is highly dependent on the accuracy of setting emission of gases and aerosols. Available emissions data usually are very late in time and are the result of indirect estimates based on population density, presence of the industrial sector and parameters of the surface. To run COSMO-ART we use TNO emissions database (with resolution 8x8 km, 1 hour).

Model results have been compared with observations. This comparison have shown that the model is able to simulate the spatial-temporal features of concentration fields adequately. It was noticed that in case of considering of background values model results are close to observations. But analysis of model results over central (high-polluted) area of Moscow have shown distinction between model and observations. So, detailed description of emission data in big cities is necessary to improve short-term forecast of air pollutants' concentrations in Moscow region. The idea of specification of emissions was proposed in this work.

Our recent results of COSMO-ART application over the Moscow region and verification of model results will be discussed.