



## Short-term forecast of carbon monoxide concentrations over Moscow region

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Assessment of atmospheric air quality is an extremely important task which has the greatest significance in the Megacities. Nowadays the main tools for short-term forecast of air pollutants concentrations are numerical models. COSMO-ART model have been used in this research. Quality of the model results is highly dependent on the accuracy of setting emission of gases and aerosols. Majority of chemical-transport models uses different emissions inventories. This sort of data is the result of indirect estimations based on population density, presence of the industrial sector and parameters of the surface. The first studies of model results have shown that for CO concentrations forecast in Moscow detailed emissions dataset is necessary.

The new method of calculations of carbon dioxide emissions has been developed. Proposed method is based on the CO concentrations measurements and meteorological data. Calculated emissions have hourly resolution and suitable for chemical-transport model. Main advantage of this method is absence of time delay: as soon as concentrations of CO are available, emissions of CO can be calculated. Such method takes into account all sources of CO which exist in the city. Besides, day-to-day fluctuations are considered. This is the main difference of proposed method from emissions inventories.

According to this research, calculated emissions can be used as emissions data for chemical-transport models in order to make operational forecast of CO concentrations. Numerical experiments have been done using COSMO-ART model. Examples of forecast are presented for Moscow megapolis. Model results have been compared with concentrations measurements. Proposed method of emissions calculation improves quality of forecast of spatial-temporal distribution of CO concentrations. Designed method of calculations of carbon monoxide emissions gives an opportunity to implement a short-term forecast of the carbon monoxide concentrations.