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Assessment of seasonal variability of air pollution by transport in Belarus

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Air pollution problem is the main challenge of the present. It is known that the transport is one of the main emission sources of such pollutants as NO_x, CO, and TSP. Thus decreasing of emissions from the mobile sources could be one of the key elements of air emissions problem solution. The developing of measures to reduce the negative impact of the air pollution requires detailed information on emissions sources and the relationship between emissions and air quality. The article is devoted to assessment of annual variability of air pollution by transport and revealing the correlation between emissions of pollutants and their concentration.

Emissions assessment of main pollutants (NO_x, CO, SO₂, NMVOC, TSP) was carried out using emissions model COPERT, which is widely used to assess emissions from transport sector on different levels of aggregation – from city to country. The main input parameters of the model are vehicle fleet information (number of vehicles by fuel type, environmental standards, and the engine capacity), fuel consumption, meteorological conditions, mileage by vehicle types, average speeds for each category of vehicles. Data on pollutants concentration in the air were obtained from the National environmental monitoring system of Belarus.

It was shown that the annual emissions variability differs depending on type of pollutants. In particular the maximum carbon monoxide emissions were observed in cold months, and minimum - in warm months. The main source of CO emissions variation is emissions during the cold start. In the case of NMVOC emissions the situation is reverse. Maximum emissions were obtained in August and minimum emissions in winter months. Comparison of the obtained emissions data with the concentration has shown high correlation for CO and NMVOC.

The findings could help to understand ways of air quality formation thereby to develop a solution on air quality management.