

## The Comparison between Modelled and Measured Nitrogen Dioxide Concentrations in Cold and Warm Seasons in Kaunas

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**Abstract :** Road traffic is one of the main sources of air pollution in urban areas associated with adverse effects on human health and environment. Nitrogen dioxide (NO<sub>2</sub>) is considered as traffic-related air pollutant, which concentrations tend to be higher near highways, along busy roads and in city centres and exceedances are mainly observed in air quality monitoring stations located close to traffic. Atmospheric dispersion models can be used to examine emissions from many various sources and to predict the concentration of pollutants emitted from these sources into the atmosphere. The study aim was to compare modelled concentrations of nitrogen dioxide using ADMS-Urban dispersion model with air quality monitoring network in cold and warm seasons in Kaunas city. Modelled average seasonal concentrations of nitrogen dioxide for 2011 year have been verified with automatic air quality monitoring data from two stations in the city. Traffic station is located near high traffic street in industrial district and background station far away from the main sources of nitrogen dioxide pollution. The modelling results showed that the highest nitrogen dioxide concentration was modelled and measured in station located near intensive traffic street, both in cold and warm seasons. Modelled and measured nitrogen dioxide concentration was respectively 25.7 and 25.2 µg/m<sup>3</sup> in cold season and 15.5 and 17.7 µg/m<sup>3</sup> in warm season. While the lowest modelled and measured NO<sub>2</sub> concentration was determined in background monitoring station, respectively 12.2 and 13.3 µg/m<sup>3</sup> in cold season and 6.1 and 7.6 µg/m<sup>3</sup> in warm season. The difference between monitoring station located near high traffic street and background monitoring station showed that better agreement between modelled and measured NO<sub>2</sub> concentration was observed at traffic monitoring station.

**Keywords :** air pollution, nitrogen dioxide, modelling, ADMS-Urban model

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