



## **Modeling of physico-chemical properties of gaseous compounds for urban stations in Romania**

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The ability of chemistry-transport models (CTMs) to accurately simulate gases and aerosols in urban areas is still to be demonstrated due to the modeling uncertainties related to emissions inventory, transport, aerosol removal, model resolution etc. The objective of this study is to evaluate the ability of the regional air-quality model CHIMERE coupled with the WRF meteorological model to simulate the atmospheric composition in the urban environment of Romania using the anthropogenic emissions provided by the EMEP inventory. The continuous measurements for O<sub>3</sub>, NO, NO<sub>2</sub>, SO<sub>2</sub>, and CO in urban areas give us the possibility to assess the performance of the air quality model with observations. One of the main difficulties of the simulation was to take into account the complexity of the air parcels dynamics in the Romanian area due to the complex topography associated with the Romanian territory. To do so, we have set-up a nested modeling system that allows us to accurately reproduce the fine scale dynamics associated to the complex topography of the measurement sites. Results of the comparisons between model and measurements will be presented and analyzed for a large set of pollutants (NO, NO<sub>2</sub>, O<sub>3</sub>, SO<sub>2</sub>, CO). The analysis shows that the model is able to reproduce the daily temporal variability for ahead mentioned compounds, however it is not capable to capture localized events during the day. Our study shows that a comparison with the measurements is often difficult, because of measurements artifacts and also because of the modeling uncertainties, e.g. related to the emissions inventory (coarse resolution of the anthropogenic emissions inventory), transport, model resolution, which can play a dominant role.