



Sensitivity of simulated ozone to different sources of uncertainties; WRF-Chem modelling study

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The purpose of this research is to evaluate and compare the sensitivities of simulated near ground ozone to different a priori known sources of uncertainties, like quantity and speciation of anthropogenic emissions, initial and boundary chemical conditions, model horizontal resolution and meteorological representation of the planetary boundary layer. The sensitivity tests are performed with a WRF-Chem model for 8-14 August 2003 high ozone episode in Slovenia. The effects of different assumptions on simulated ozone levels are analyzed for 12 Slovenian measuring sites and results of simulations are evaluated by measurements.

According to our results for the complex terrain of Slovenia the way how the planetary boundary layer is represented in a model appears to be the most problematic among all sources of uncertainties during the selected stagnant anticyclonic situation. With the examples of influence of model turbulence parameterization and land surface exchanges on simulated ozone, and the comparison of these results to the results of other ozone sensitivity tests (to emissions, boundaries, model resolution etc.), we show that one of the major challenges in air pollution modelling is still treatment of physical processes in the model.