Uncertainties of input parameters of an ozone deposition model

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Deposition models are effective tools to simulate the short and long-term effects of near surface ozone and results of these models can be useful for both environmental and climate change related studies. However, the input data and the parameters of the models are more or less uncertain, and some other parameters have great, but less known temporal variability. Therefore, it is very important to know the effects of each input values on the model outputs. For this purpose, uncertainty analyses of a detailed deposition model have been performed to investigate the uncertainties in model results given by the uncertainties of input parameters. Our model describes daytime deposition processes in the mid latitude during summer periods. To investigate the effects of uncertainties, two global methods, the Morris and the Monte Carlo analyses with Latin hypercube sampling have been applied. These methods require a large number of model runs in which the parameters vary between their uncertainty limits according to an algorithm. In addition, for the Monte Carlo method the estimation of the probability density functions of the parameters are also required. Model simulations have been carried out with several parameter sets, and the results of model runs have been processed with statistical methods.