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Aerosol distribution over Europe: a model evaluation study with detailed aerosol microphysics

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Abstract. This paper summarizes an evaluation of model simulations with a regional scale atmospheric climate-chemistry/aerosol model called REMOTE, which has been extended by a microphysical aerosol module. Model results over Europe are presented and compared with available measurements in surface air focusing on the European distribution and variability of primary and secondary aerosols. Additionally, model results obtained with detailed aerosol microphysics are compared to those based on an aerosol bulk mass approach revealing the impact of dry deposition fluxes on atmospheric burden concentration. An improved determination of elevated ozone and sulfate concentrations could be achieved by considering a diurnal cycle in the anthropogenic emission fluxes. Deviation between modelled and measured organic carbon concentrations can be mainly explained by missing formation of secondary organic aerosols and deficiencies in emission data. Changing residential heating practices in Europe, where the use of wood is no longer restricted to rural areas, need to be considered in emission inventories as well as vegetation fire emissions which present a dominant source of organic carbon.

[Final Revised Paper](#) (PDF, 1448 KB) [Discussion Paper](#) (ACPD)

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