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SALSA – a Sectional Aerosol module for Large Scale Applications

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Abstract. The sectional aerosol module SALSA is introduced. The model has been designed to be implemented in large scale climate models, which require both accuracy and computational efficiency. We have used multiple methods to reduce the computational burden of different aerosol processes to optimize the model performance without losing physical features relevant to problematics of climate importance. The optimizations include limiting the chemical compounds and physical processes available in different size sections of aerosol particles; division of the size distribution into size sections using size sections of variable width depending on the sensitivity of microphysical processing to the particles sizes; the total amount of size sections to describe the size distribution is kept to the minimum; furthermore, only the relevant microphysical processes affecting each size section are calculated. The ability of the module to describe different microphysical processes was evaluated against explicit microphysical models and several microphysical models used in air quality models. The results from the current module show good consistency when compared to more explicit models. Also, the module was used to simulate a new particle formation event typical in highly polluted conditions with comparable results to more explicit model setup.

[Final Revised Paper](#) (PDF, 581 KB) [Discussion Paper](#) (ACPD)

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