

Interactive comment on “Simulation of particle size distribution with a global aerosol model: contribution of nucleation to aerosol and CCN number concentrations” by F. Yu and G. Luo

F. Yu and G. Luo

yfq@asrc.cestm.albany.edu

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Thanks for your further comments, Jeffery. Below is our clarification about the coagulation calculation.

In our simulation, the coagulation process is separated from the nucleation/growth/H₂SO₄ production processes. While we use variable time step for the self-coagulation of sulfate particles and sea-salt particles, scavenging of sulfate particles by all primary particles are considered in each chemistry time step. Generally, the growth rates of freshly nucleated particles are several nanometers per hour and our time step is small enough that the time-splitting procedure should have relatively

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small effect on the evolution of nucleated particles (compared to the uncertainties in SOAs, hygroscopic growth, sizes of primary particles, etc.). It should be noted that time-splitting treatment of different processes (such as advection, chemistry, deposition, cloud processing, etc.) is frequently used in the 3-D modeling.

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