

Interactive comment on “Effects of model resolution and parameterizations on the simulations of clouds, precipitation, and their interactions with aerosols” by Seung Soo Lee et al.

Anonymous Referee #2

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This paper nicely demonstrates the role of spatial resolution and microphysics in determining differences between a model with high resolution and bin representation of microphysics compared to low resolution and bulk representation of microphysics. It should be published after clarification of the following and/or improvement in wording.

Many places use “resolutions” where I would have thought “resolution” was best English usages.

Line 71: Change “These” to This

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Line 136: change “less than” to “above”

Lines 118 – 126: this cannot be the full description of ammonium sulfate sources and sinks, since it only describes the interaction of aerosol with clouds. What about nucleation from the gas phase production of sulfate? How is gas phase sulfate produced? Do you represent condensation onto existing aerosols? What about dry deposition loss?

Fig 1a,b: please increase size of rectangle, similar to 1c, d.

Model set up: What is used for boundary conditions for the CSRМ? How do these boundary conditions compare to the incoming air in the GFS simulations?

Line 294: what are the deposition rates shown in Fig 9? This is not surface deposition, since the units are wrong.

Line 298-300: why do updraft mass fluxes increase with higher aerosol?

Line 526: what are “high-level” updrafts? At high altitude? Similar comment for low-level updrafts. You did not discuss this in the paper. (also only updraft mass flux is in figures).

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