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# ***Interactive comment on “A parameterization of sub-grid particle formation in sulphur-rich plumes for global and regional-scale models” by R. G. Stevens and J. R. Pierce***

## **Anonymous Referee #2**

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Review of Stevens, R. G. and Pierce, J. R.: A parameterization of sub-grid particle formation in sulphur-rich plumes for global and regional-scale models, Atmos. Chem. Phys. Discuss., 13, 19583–19623, doi:10.5194/acpd-13-19583-2013, 2013.

The authors present a parameterization of sub-grid sulfate formation for use in global and regional-scale models, which, due to their coarse resolution, cannot directly represent new particle formation in sulfur-rich plumes. The parameterization utilizes commonly available input parameters from global- or regional-scale models.

While the authors developed and present a really useful parameterization, I would

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expect at least one concrete application of this parameterization in a global model. The current manuscript, as is, is more suited for publication in GMD rather than ACP. Based on the presentation of results/figures the implications for global modelers are not necessarily clear.

To warrant publication in ACP the authors ought to demonstrate how the use of this parameterization affects, for example, aerosol particle number and mass concentrations in a global model. In fact, the Conclusions section does not provide any further or new insights into the issues raised (which rightly motivate and warrant such a parameterization) in the Introduction. I am certainly not suggesting a full-blown assessment or comparison of a global model with and without the parameterization. Doing so could also help to outline how other groups could implement the parameterization.

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Interactive comment on Atmos. Chem. Phys. Discuss., 13, 19583, 2013.

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