

## ***Interactive comment on “Cloud-resolving simulations of mercury scavenging and deposition in thunderstorms” by U. S. Nair et al.***

**Anonymous Referee #1**

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This paper presents a modeling study of mercury scavenging in convective clouds. The detailed processes studied are outside of my area of expertise, but that said, I do have comments regarding the overall study design. Mainly, I am very puzzled why the authors chose mercury to study in this regard. The model results presented are completely unverified and unverifiable with current technology. For example, many of the assumptions made, such as the vertical distribution of reactive mercury, are completely unknown. I understand the value of a model where some new and verifiable prediction is made, but it is really hard to see exactly what observations could be made to verify these results. Differences in mercury deposition alone between north and south sites, would not provide the necessary information. If there is a straight forward way to verify this model, then it is essential that the authors identify this. If the model cannot be readily verified, then this is not really a scientific result and the paper should

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not be published.

My suggestion for the authors would be to apply the same model to a compound or compounds that are also readily scavenged and can be observed. For example there is a wealth of data on HNO<sub>3</sub> from aircraft studies. Why not apply this model to HNO<sub>3</sub> and use the existing observations to see if it makes sense?

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