

## ***Interactive comment on “Mapping the drivers of uncertainty in atmospheric selenium deposition with global sensitivity analysis” by Aryeh Feinberg et al.***

### **Anonymous Referee #2**

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This paper introduces a newly developed global model for simulating the atmospheric cycling of selenium and also presents a detailed uncertainty analyses for the model simulations. I find this to be a very interesting study and I can see lots of efforts has been put into this work. A few specific questions and comments I have –

1) It is desirable to report the Se emissions calculated in the model, preferably in a table. Since there have been some literature on this (e.g. Mosher and Duce, 1987 and some more recent ones) which clearly summarized the Se emissions from all major sources (including volcanic, marine biosphere, terrestrial biosphere, and anthropogenic sources), it would be very helpful to compare results from this study with the literature.

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2) It is reported that the model tracks Se in 7 gas-phase species and 41 aerosol tracers, it would be helpful to clarify how much are emissions for each of the Se species.

3). "all four Se sources (volcanic, marine biosphere, terrestrial biosphere, and anthropogenic emissions) contributing equally to the uncertainty in deposition over agricultural areas." – I'm kind of surprised with this and I don't see enough data supporting this conclusion.

4). Section 5.1, the discussion on atmospheric lifetime of Se – it's useful to look at the parameters related to emissions, but the more important factor regulating the atm. Lifetime is meteorology, in particular precipitation (including both the precipitation amount and spatial distribution). Is the year 2000 happen to be a dry or wet year (indicated by the meteorology data you use for that year)? How much would be the likely variation of atm. lifetime caused by the interannual variability in meteorology? More discussion on this would be more relevant and valuable.

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