

Response to reviewer #2

We thank the reviewer for the comments to the paper. Below are our responses to the reviewer's comments.

Comments

To me the main remaining difficulty in explaining POCs is understanding the aerosol budget. Section 6.3 attempts to solve this, but is unsuccessful. The main problem is that the source term from the modeled sea-to-atmosphere flux is much more variable than the sink terms. Ultimately that means that the extremely simplified approach is not suitable to describe the many processes leading to the hypothesized equilibrium aerosol state.

We agree with the reviewer that the proposed budget equation appears to be too simple to describe the various processes involved in determining the equilibrium aerosol state. We have expanded on the sentence on Page 8308 Line 3-4 such that it now reads: "There are several possible reasons for this discrepancy in addition to the simplicity of the budget in Eq. 1."

The LES modeling study of POCs by Berner et al. (2014) also exhibits an equilibrium aerosol state, so further tests with LES will likely be necessary to diagnose whether a feedback mechanism exists that keeps subcloud aerosol concentrations relatively constant across different POCs. This is included in our Discussion and Conclusions section.

pg. 8307: Integrated over the size distribution of the PCASP: I think the authors mean integrated over the same size range as sampled by the PCASP.

Done.