

Response to Reviewer 2

Once again we thank the reviewer for taking the time to read through our revised manuscript and would like to respond to the final comments that were made to our revision.

In particular, the reviewer says the following: **As for the assertion to another reviewer that all attribution of EIE to certain types of aerosols has been carefully removed, I can only point to line 696-697 of the manuscript that states “The current study has established a pathway that associates extreme ice concentrations with the surface emissions of particles from biomass burning and fossil fuel combustion.” There it is, for all to potentially mis-reference. While this admittedly follows a paragraph that emphasizes the association with convective dynamics, the list of subsequent remaining questions does not mention the critical role of deep convection, nor leave a question as to whether the aerosol sources matter in general for the production of EIE.**

We respectfully disagree with the reviewer’s concern that our conclusion regarding the association between extreme ice concentrations and surface aerosol emissions will be mis-referenced. Nevertheless, following the reviewer’s recommendation, we have now added a final bullet to the unresolved questions: “Does deep convection with strong updrafts minimize the importance of aerosol composition?”

As to the reviewer’s second statement: **I remain completely baffled by authors’ understanding and discussion of homogeneous freezing as happening on particle “surfaces” in their response. A surface does not exist for a dissolved particle. If there is anywhere in aerosol-cloud interactions research that careful terminology is needed, it is in the area of distinguishing heterogeneous and homogeneous nucleation processes and the specific role or not of particle surfaces in the formation of cirrus clouds. If it were stated this way in the paper, it would set the ice nucleation community back years in their efforts to use concise language, I would say. Nevertheless, the point is moot, because I could find nowhere in the paper where such a discussion now occurs, and what is clarified now is quite sufficient for distinguishing processes that relate to aerosol properties, and evolve and impact cirrus, in very different ways.**

It appears that no further action in the manuscript is needed.