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Atmospheric Chemistry and Physics Discussions

Interactive comment on "Decreasing particle number concentrations in a warming atmosphere and implications" *by* F. Yu et al.

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General issues:

1. Nucleation schemes and their temperature dependence. It remains to be established how much other species such as amines may contribute to global particle formation and affect the temperature dependence. Based on the ternary nucleation involving ammonia, the temperature dependence is overall stronger than ion mediated nucleation. As the referee also pointed out, due to correlated changes of other key variables with temperature, it is hard to isolate the impact of temperature from field measurements. We have modified the text and conclusions to reflect the uncertainties.

2. CN data.

(1) We could not find any evidence of these in the data records. It should be noted that measurements at NOAA background sites are intended to be long-term and instruments are relatively well maintained. The CN data, available at NOAA web site, are reasonably quality assured.

(2) Agree. Instead of attributing the trends to DMS emission only, we give a broad list of possibilities (including anthropogenic emission reduction) that might explain trends and that could be explored in future work. The abstract, text, and summary have been revised accordingly.

(3) As far as we know, there are no systematic long-term ship-based measurements of oceanic DMS concentrations over the past 30 years.

Specific points:

P27918. Yes. It is now explicitly stated in the revised manuscript.

P27921. Corrected.

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