Atmos. Chem. Phys. Discuss.,
https://doi.org/10.5194/acp-2017-941-RC2, 2017

Atmospheric Chemistry and Physics Discussions

Interactive comment on "In situ measurements of angular dependent light scattering by aerosols over the contiguous United States" *by* W. Reed Espinosa et al.

Anonymous Referee #4

Received and published: 13 December 2017

This paper presents aerosol phase function measurements made from aircraft. The phase function measurements, and other measurements, are used to investigate the possibility of classifying the aerosol types based on the measurements. The measurements are significant because they include aircraft measurements over various regions of the US. The paper presents interesting results where they are able to differentiate anthropogenic accumulation mode and soot accumulation mode aerosols using polarization measurements.

Problems: 1) to describe 1/(Mm) use (Mm)-1 not Mm-1. Please use standard scientific notation.

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Discussion paper

The method uses an aerosol sampler which is inside the aircraft and the air is brought in with a shrouded diffuser inlet. It is not clear what the cutoff size was for the larger aerosols. In Dolgos and Martins (2014) they state it was 5 um. This is an important issue. If it was at 5um diameter then only part of the coarse mode is being sampled. The fraction of coarse mode aerosols present in the measurement will affect the phase function (particularly in the forward scattering direction). These problem issues are not well discussed.

(pg5-35) If the aerosol are hygroscopic they can be affected by changes in RH. The authors claim the heating they are applying does not affect the measurement because they compare with the Integrating Neph which also dries the air with a nafion tube. This argument is not clear to me? The authors do mention the possibility of heating due to ram pressure but do not attempt to address this uncertainty.

Interactive comment on Atmos. Chem. Phys. Discuss., https://doi.org/10.5194/acp-2017-941, 2017.