Responses to Anonymous Referee #4

We would like to thank the reviewer for his/her time, thoughtful insights and helpful comments. A point-by-point response to each of the reviewers concerns is listed below. The reviewers comments are shown in bold italics, while the authors' responses are indented and displayed in regular type.

To describe 1/(Mm) use $(Mm)^{-1}$ ***not*** Mm^{-1}***. Please use standard scientific notation.***

> The reciprocal milliseconds example in rule 5 of the NIST style guide for SI units (https://physics.nist.gov/cuu/Units/checklist.html) suggests that Mm^{-1} is also an acceptable form. Additionally, in a brief survey of papers recently published in ACP (Zhang et al., 2015; Rosati et al., 2016; Bi et al., 2017) we found the form Mm^{-1} to be used in all instances. For these reasons, the authors feel that using Mm^{-1} will maximize clarity for the reader but we are certainly open to changing to the $(Mm)^{-1}$ form if the reviewer or the editor strongly favors doing so.

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.

> The authors appreciate the reviewer catching the ommision of this information. The inlet is known to have a 50% passing efficiency at an aerodynamic radius of 1.8μm (McNaughton et al., 2007). This statistic has been added to the fourth paragraph of section 2.2.
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> Additionally, the following sentence has been added to the end of the fourth paragraph of Section 4:
> "It should also be noted that the true forward scattering peak of the ambient aerosol may be even larger than the values reported by the PI-Neph, whose sample is subject to inlet cutoff effects which disproportionately effect the largest particles."

(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.

> The aerosol data reported here are measured under predominantly dry conditions and are not intended to represent the scattering properties at ambient relative humidities. The comparison with the Integrating Nephelometer measurements is intended to show that the potential evaporation of volatile compounds, resulting from our temperature based drying procedure, has very little effect on the scattering properties of the dry particles.

In order to help clarify this point the first sentence of the paragraph in question was replaced with the following text:
"The scattering properties of hygroscopic aerosols are influenced by the uptake of water which typically occurs at relative humidities (RH) greater than 40% (Ziemba et al., 2013; Orozco et al., 2016). The PI-Neph's sample was conditioned with a temperature-controlled drier that reduced the sample's RH by heating the incoming ambient air to a temperature of 35°C. In almost all cases this approach was found to reduce the sample's RH below 40% so the reported properties are thought to be representative of "dry" particles.

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