Response to Reviewer 1 comments

We thank the reviewer for her/his comments, and have carefully addressed each comment and improved the paper. Below find our point-by-point responses to reviewer 1 comments, where first the reviewer comment is repeated in italics, followed by our response in bold.

Comments to the Author:

1. Suggest describing briefly the major conclusions how aerosol size, composition and refractive index influence optical response in the abstract.

We have substantially rewritten the abstract to address this suggestion.

2. Abstract, line 13 – 15, rephrase. It is difficult to read.

This sentence was completely rewritten as described above.

3. Page 2, second paragraph, suggest adding some discussions on vertical measurement to highlight the advantage of portable scattering instruments.

Thanks for this comment. We added one sentence to describe advantage of portable scattering instruments for vertical profile measurements.

4. Page 4, line 2, make sure the density of PSL. It is 1.05 g cm-3.

The 1.65 g cm^{-3} is the value used in the OPC-N2 software for transferring the volume concentration of ambient aerosol to mass concentration, and it is not the density of PSL.

5. Page 5, line 7, any reasons for choosing these four different compounds?

Compounds were chosen that first of all were available to us in our laboratory. More importantly, these compounds represented some of the major chemical species types (sulfate, nitrate, ammonium, organics) that we observed in the northeast US. Third, the compounds were water soluble and relatively stable, so that we could generate well characterized pure synthetic aerosols.

6. Use log scale for x-axis in Figure S3.

Thanks for this comment. As you suggestion, we modified the figure S3.

Again thank you for all your valuable comments, which have helped to improve the paper.

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