

***Interactive comment on “Characteristics, sources, and transport of aerosols measured in spring 2008 during the aerosol, radiation, and cloud processes affecting Arctic climate (ARCPAC) project” by C. A. Brock et al.***

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Received and published: 14 January 2011

Thank you for the comments on the manuscript.

Regarding the discrepancy of 26% between the calculated (via Mie theory from measured size distributions) vs. measured visible light scattering, there are several sources of error that could produce this bias. The Mie calculation was performed using the same refractive index (1.52-0i) as the calibration particles (ammonium sulfate). Since the primary accumulation mode instrument is a wide-angle-scattering optical particle

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counter, the retrieved scattering should not be a strong function of refractive index. In other words, most bias in sizing calibration due to refractive index is reversed when scattering is then calculated based on the reported size using the same refractive index. We consider the cavity ringdown extinction instrument to be extremely accurate, based on thorough calibration and testing as described in the Baynard et al. reference. The most likely bias is the optical particle counter flow problem, which is extensively described in the Supplemental Material. In the revised manuscript we have added a mention of the possible sources of bias, that they most likely reside in the size distribution measurement, and pointed to the Supplemental Material for more detailed discussion. We note that the instrumental agreement is within the (large) stated uncertainties.

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Interactive comment on Atmos. Chem. Phys. Discuss., 10, 27361, 2010.

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