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Comment

## ***Interactive comment on “SAGE III aerosol extinction validation in the Arctic winter: comparisons with SAGE II and POAM III” by L. W. Thomason et al.***

**L. W. Thomason et al.**

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We wish to thank Pat Hamill and the other reviewer for their comments and sights. Their work has clearly made our manuscript better and we greatly appreciate their contribution.

Reviewer 2:

The reviewer is correct that the simple PSC-clearing method used in this paper is likely to miss some PSCs. The over riding reason to eliminate PSCs from the analysis is that PSCs tend to be spatially inhomogeneous and, for the geometry of these instrument, matching PSCs events (very rare) yields extremely different results simply due to spatial variability. Restricting ourselves to low values of extinction mitigates this problem.

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The extinction cutoff of  $4 \times 10^{-4} \text{ km}^{-1}$  is arbitrary and was used to exclude a few high extinction values that leaked past the temperature cutoff. This complicates the comparison however biggest outstanding issue for SAGE III extinction data quality is at low values. In addition, solar occultation measurements of aerosol extinction improve in quality for increasing magnitudes of extinction so it is not unreasonable to expect the results for low extinctions to persist into the higher values exhibited by PSCs. We have clarified this in the text.

The statistic  $r$  used in figures 9 and 12 is computed from figures 7, 8, 10, and 11 (and others not included in the manuscript) and listed on the figure as the mean. We have clarified this in the text and in the figure captions.

We have removed the dashed lines in figures 8, 11, and 13 since they are not critical to the discussion.

The data shown in Figures 8 and 11 reflect the noise in the POAM III 1020-nm extinction and to a lesser extent the noise in POAM III 442-nm extinction at and below 18 km while the SAGE III and SAGE II continue to agree well at these altitudes (or at least consistently). It would be better if all three instruments agreed however; it seems likely that POAM III is the outlier in these figures rather than SAGE II. This is mostly a reflection of the noise in the POAM III data previously noted. We have clarified this in the text.

We have added text to clarify the use of PV as a matching coordinate.

We made the typographical corrections listed at the end of the review.

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Interactive comment on Atmos. Chem. Phys. Discuss., 6, 11357, 2006.

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