

Interactive comment on “Optical particle counter measurement of marine aerosol hygroscopic growth” by J. R. Snider and M. D. Petters

Anonymous Referee #2

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The paper provides a method for obtaining estimates of aerosol growth factors from aerosol size distribution measurements from two Particle Measurement Systems' (PMS) probes. The Passive Cavity Aerosol Spectrometer Probe (PCASP) measures the particle size internally and after drying the particles. The Forward Scatter Spectrometer Probe (FSSP-300) measures their size in the ambient air and at the ambient humidity. Comparison of the separation of the size distributions from the two instruments in the overlapping size range is used to determine growth factors. In recent years direct methods of measuring growth factors have come into play. The results obtained by this present method seem compatible. The value of this technique probably is primarily in that it permits growth factor estimates to be obtained from older data sets, obtained when direct growth factor measurements were not present.

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Perhaps the most interesting aspect of the paper is the novel way of determining the view volume of the FSSP-300. However, its description and its rationale are inadequate. The reason for adjusting the active laser area till predicted Poisson frequency of zero count-rate equals the calculated one needs to be explained. Why is this a better way of determining the active area than simply equating concentration of particles in the overlap range?

It seems strange that measured true air speed is not used in determining the view volume of the FSSP-300. Why not? How robustly does the 110 m/s speed used represent the actual speed of the C-130?

The description of the discrepancies between particle concentrations measured inside the aircraft cabin and the wing probes is interesting, but not relevant. Although the cause of the discrepancy is unknown, and in the worst case would mean the analyses were done on data having uncertainty in concentration, the results here would only be affected if sizing of the particles by the wing probes were in error. Unfortunately, discrepancies in the size distributions from the two instruments suggest there may have been some calibration issues. Instead of detailing the discrepancy in concentration between measurements inside and outside the cabin, it seems more space may be dedicated to what effort was expended to calibrate the instruments and minimize sizing errors.

Minor comments:

Page 12388, lines 17-18: Typo! “Wind-mounted” probably meant to be “wing-mounted”.

Page 12390, line 28: “vide intra”? Can the meaning of this be expressed in English?

Interactive comment on Atmos. Chem. Phys. Discuss., 7, 12381, 2007.