

Interactive comment on “Properties of polar stratospheric clouds obtained by combined ACE-FTS and ACE-Imager extinction measurements” by A. Y. Zsetsky et al.

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The retrieval of polar stratospheric cloud properties from the ACE satellite mission is described. This is an interesting paper because it combines, as far as I know for the first time, the wavelength range of different solar occultation instruments (from about 13 to 0.5 μm) to obtain information on PSC particle size and composition. Especially I'm happy that the NO_3^- - ν_2 -band of NAT at 820 cm^{-1} which was detected in IR-limb-emission measurements of CRISTA and MIPAS has now also been identified in solar absorption spectra.

p13272, I9: 'Our results indicate that liquid ternary solutions with a high (>30 wt%)

content of HNO₃ were the most probable component of the clouds...'

-> The composition of the liquid ternary solution PSCs retrieved is only mentioned in the abstract. It would be helpful if this result could be described in more detail in the body of the paper.

p13272, l24: 'Hopfner et al., 2002':

-> This reference for MIPAS/Envisat PSC observations is not appropriate here since it only describes balloon-borne data, better use one of the following: [[Spang et al.\(2005\)](#), [Höpfner et al.\(2006a\)](#)].

p13276, l16: 'for solid hydrates and ice particles, the discrete dipole technique (Draine et al., 1994) was used.'

-> Could you tell which particle shape has been assumed?

p13277, l18: 'The total error is computed as a combination of the statistical error of the least squares fitting and the uncertainty associated with the particle shape and the finite length of the spectral region.'

-> Could you also provide an estimate on the error due to the used refractive index data? E.g. the data of STS by Biermann et al. seems to have some problems as shown in [[Wagner et al.\(2003\)](#)] (this is especially of interest for the composition retrieval of ternary solution particles mentioned in the abstract).

p13279, l.22: 'The band near 820 cm⁻¹ (see inset) is characteristic of NAT (Hopfner et al., 2002).'

-> The reference to Höpfner et al., 2002 is not adequate here. The band has first been spotted by [[Spang and Remedios\(2003\)](#)] in CRISTA observations and has spectroscopically been identified as a NAT-feature by [[Höpfner et al.\(2006b\)](#)] in MIPAS/Envisat measurements.

p13287, Figure 2:

-> Could you describe in the caption the shaded regions?

p13288, Figure 3 and p13290, Figure 5:

-> Since the volume density of PSCs is in the order of $\mu\text{m}^3/\text{cm}^3$ i.e. of 10^{-12} either units or the factor might be missing in the caption of the y-axis.

References

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