

***Interactive comment on* “Commentary on
“Measurements of ice supersaturations exceeding
100% at the cold tropical tropopause” by E.
Jensen et al.” by D. M. Murphy**

Anonymous Referee #1

Received and published: 16 May 2005

In this commentary paper D. M. Murphy discusses the fact that specific aircraft maneuvers may contribute systematic errors to the evaluation of the very high ice saturation ratios presented by E. Jensen et al. The highest ice saturations reported by Jensen et al. are measured during decent through the tropopause which coincides with a right turn of the WB-57F aircraft at about 2° roll and -1.5° pitch.

In my view this commentary paper clearly points out that one needs to be very careful in evaluating aircraft temperature and relative humidity measurements in general but especially during aircraft maneuvers that require additional correction and in flight cali-

Full Screen / Esc

Print Version

Interactive Discussion

Discussion Paper

bration. Therefore, it is a valuable contribution to the ongoing discussion whether very high ice saturations measured in the tropical tropopause region are real.

Concerning the conclusions drawn in the commentary I would like to add the following comments:

1. Figure 2 shows enhanced ice saturations for positive roll angles compared to negative ones. I agree with referee #2 that it is important to know if there is a systematic calibration bias for the roll angle which could affect the conclusion for the ice saturation bias.
2. Can the author give at least an estimate for the temperature bias due to aircraft maneuvers e.g. from testing the sensor response on that during other missions?
3. The correlation between roll angle and ice saturation ratio is also not too convincing to me from Figure 1. Is there an explanation why the distinct roll angle peak at the lower edge of the period in turn does not seem to affect the saturation profile?
4. In line 11 ff. the author mentions the possibility of the aircraft rolling in response to the wind shear. If this was the case and if the aircraft was passing the regions of ice supersaturation shown in Figures 1 and 2 always in the same direction relative to the wind direction, the correlation between the roll angle and the ice saturation may simply reflect a correlation between ice saturation and high wind shear. Can this possibly be excluded from the flight pattern or for other reasons?

Interactive comment on Atmos. Chem. Phys. Discuss., 5, 2463, 2005.

[Full Screen / Esc](#)[Print Version](#)[Interactive Discussion](#)[Discussion Paper](#)