

## ***Interactive comment on “Formation of large ( $\approx 100 \mu\text{m}$ ) ice crystals near the tropical tropopause” by E. J. Jensen et al.***

**E. J. Jensen et al.**

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In the process of responding to reviewers' comments, an additional error was identified that has significant implications. Specifically, the 2D-S size distribution data shown in Figure 4 was not correct. The simulation results chosen for comparison with the observed size distribution had very low ice concentrations ( $<1/L$ ), whereas the 2D-S measurements for the 1 February TTL cirrus case actually show concentrations of  $\sim 20/L$ . In the revised manuscript, we focus on simulating both the formation of large crystals as well as the production of  $\sim 20/L$  total ice concentration. We now emphasize that the observed ice concentrations for the 1 February TTL cirrus case (about  $20/L$ ) can only be reproduced in simulations with very slow cooling ( $\leq 0.5$  K/hour; equivalent to about  $1.5$  cm/s updraft). Given the fact that gravity-wave temperature perturbations are more-or-less ubiquitous in the tropopause region, it seems surprising that larger

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ice concentrations (along with resulting severe dehydration) were not observed.

Lastly, we have concluded that the tone of the manuscript should be changed somewhat. Given the uncertainties in both ice crystal aspect ratio and water vapor concentration, it seems reasonable to discuss implications from both perspectives. The original manuscript discussed the implications modest aspect ratio (~6:1) large ice crystals for water vapor concentrations. In the revised manuscript we also discuss the implications of relatively low water vapor concentrations for the large ice crystal growth and properties.

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Interactive comment on Atmos. Chem. Phys. Discuss., 7, 6293, 2007.

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