

Interactive comment on “On the importance of small ice crystals in tropical anvil cirrus” by E. J. Jensen et al.

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We appreciate the helpful technical comments. We have made the suggested changes to the paper with the following exceptions and notes:

1. This paper and other recent publications casting doubt on measurements of ice concentration in cirrus should perhaps call for a critical review of past evidence indicating that various ice multiplication mechanisms are required to explain discrepancies between measured ice nuclei concentrations and ice concentrations. Other than Hallett-Mossop rime splintering, none of the multiplication mechanisms has been shown to produce significant concentrations of ice crystals under atmospherically relevant conditions in laboratory experiments. However, this is an expansive topic that would require a considerable literature review. A short statement in this paper would not suffice to

C1036

adequately address the issue. Therefore, we believe it is best to leave this topic for a future study.

2. In the process of adding the DC-8 flight track to Fig. 16, we discovered an error in our analysis. The MAS image corresponded to a time slightly later than the time series shown in Figure 15. We have included the correct MAS image in the revised manuscript. The interpretation is now very different. There is still some evidence of a banding pattern in the cloud, but it looks more like shallow convection than purely waves. Also, the MAS effective radius retrieval clearly shows regions with very small effective radii early in the time series corresponding to the times when the 2D-S measurements indicated very large concentrations of small crystals, which is consistent. We have changed the discussion in the revised manuscript accordingly.

Note that we have added the DC-8 flight track (black line). The ER-2 and DC-8 were in a closely-coordinated stacked flight pattern during this time period, thus the DC-8 flight track runs down the center of the MAS swath.

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