

Interactive comment on “Influence of heterogeneous freezing on the microphysical and radiative properties of orographic cirrus clouds” by H. Joos et al.

Anonymous Referee #2

Received and published: 22 October 2013

Review of 'Influence of heterogeneous freezing on the microphysical and radiative properties of orographic cirrus clouds' by Joos et al.

The study examines the competition between heterogeneous and homogeneous ice formation during the evolution of an orographic wave cloud. The subsequent effects on the radiative impact of the cloud are explored.

I found the paper interesting and it would be publishable once the following points have been addressed.

1. The study, and the results given, are very specific to the dynamic and environmental

C8327

profiles employed. It would be useful to discuss the wider relevance of these results in terms of their application to different situations e.g. stronger or weaker orographic forcing, different wavelengths etc.

In particular, the IN concentrations considered are much smaller than the ice concentration formed through homogeneous freezing. Although probably not realistic it is interesting to consider the situation where the IN concentration starts to approach the concentrations of ice due to homogeneous freezing. Does the behaviour of IWP, optical thickness and cloud forcing still change monotonically or is there a turning point in the behaviour. It would be good to know where the monotonicity breaks down.

2. The proof reading of the paper needs to be improved. Some values are missing (eg xx p18087 line3). Some sentences were difficult to understand e.g. between l5-10 p18085.

3. The discussion seems much too detailed in terms of the methodology. I felt that I was re-reading earlier parts of the paper rather than just being reminded of the methodology. This could be summarised better.

4. Figure 1 is difficult to read.

Interactive comment on Atmos. Chem. Phys. Discuss., 13, 18069, 2013.

C8328