

## ***Interactive comment on “Application of holography and automated image processing for laboratory experiments on mass and fall speed of small cloud ice crystals” by Maximilian Weitzel et al.***

**Maximilian Weitzel et al.**

m.weitzel@mpic.de

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First of all, we would like to thank the reviewer for the useful comments and suggestions which helped to improve the manuscript. The reviewer's comment were answered in the following.

The homogeneous nucleation method was developed initially to confirm the feasibility of the chamber experiments. It is a simple approach that does not introduce pollution with aerosol particles into the chamber and provides a reliable source of nucleation of

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a substantial amount of crystals. That said, a smaller number of experiments using INP as nucleation source were conducted to form an understanding of the influence of the nucleation mechanism on the crystals' growth behavior. While no quantitative analysis on these observations was conducted, a similar fraction of crystals with irregular shapes were observed after heterogeneous nucleation induced by ice nuclei (Montmorillonite). This suggests that the observed crystal shapes are influenced by the thermodynamic conditions during particle growth within the chamber rather than by the conditions during initial freezing. As the reviewer suggests in their comment, a more thorough analysis of the differences between particle growth after homogeneous and heterogeneous nucleation in the chamber would be interesting, and can be subject of future work. However, we do not expect any influence of the freezing mode (i.e. homogeneous or heterogeneous) on the fall velocity of ice crystals of the same habit. An elaboration on the uncertainties in the understanding of the growth processes within the chamber has been added to the discussion section of the article (Line 222 and the following).

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