

## ***Interactive comment on “Single ice crystal measurements during nucleation experiments with the depolarization detector IODE” by M. Nicolet et al.***

**M. Nicolet et al.**

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First we would like to apologize for uploading a wrong version of the author comment previously. Please disregard the old version.

We would like to thank the referee for the helpful comments and suggestions. All uncertainties and unclear points have been corrected and clarified. The pictures have also been modified to make them clearer. We reply to the individual suggestions below.

- 1) The abstract will be revised and the sentences about the results will be clarified.
- 2) The theory part of light scattering is not the most important part of the paper. It is shown here as a reminder of this theory and to introduce the whole setup and its

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principles. However, as suggested by the review the theory about light scattering has been rewritten going into more depth. The definitions of the amplitude matrix  $S$ , the phase matrix  $Z$  and the scattering matrix  $F$  have been added to make this section clearer. The basic equation of the particle single-scattering (eq #2) has been added for easier understanding.

3) All pictures and captions will be checked and corrected in order to be readable by anyone. The font has been changed into the basic Arial font and, in some cases, enlarged.

4) While other units are more common to describe aerosol concentrations, this unit has become standard to describe especially ice nuclei (IN) concentrations since normally only one out of 10,000 to one million particles is a good IN.

5) To avoid any confusion, the term "single events" has been replaced by "ice particles".

6) The gain is proportional to the electric amplification of the PMT signal. It is not related to the real intensity but to the intensity that is measured (photons that emit an electron at the PMT sensitive area). Thus, this first sentence is suppressed, as it is not relevant for the following discussion and also to avoid any confusion and make it more concise.

7) According to our last calibration, channel 90 is approx.  $2.5 \mu\text{m}$  and channel 160 is around  $4 \mu\text{m}$  (both in diameter). These precisions have been added to the manuscript to clarify the explanation.

8) We have measured a calibration curve. Unfortunately, the calibration is not very accurate, as the OPC is not manufactured for size distributions but only for counting particles. Changes in refractive index and shape add further uncertainties; we therefore decided to not convert the bins into sizes and only report channels.

9) The parameterization was done only with ZINC experiments in order to have the specific breakthrough line for this setup. Meanwhile Felix Lüönd has done some droplet

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evaporation calculations which confirm this curve. We therefore suggest to add him to the co-authors for the revised paper.

10) In this case it was a hypothesis. We corrected the whole sentence to strengthen this aspect in the text, as this explanation cannot be proven in that way.

Comments 11), 12), 13), 14) were accepted.

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Interactive comment on Atmos. Chem. Phys. Discuss., 8, 20965, 2008.

## ACPD

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