

Reply to Anonymous Referee #1

We thank the Referee for the helpful suggestions which resulted in an improved manuscript.

The answers are in red.

Essentially, the experimental technique here is to provide a known supersaturation environment for ice crystals to be activated in an aerosol sample. The crystals then fall onto a supercooled sugar solution bath and grow so they can be counted. The advantage of this cloud chamber system over the usual two plate diffusion chamber is that much lower temperatures can be achieved for the whole sample. This is not pointed out in the article. (The two plate system requires a temperature difference between the plates - to obtain high supersaturation at low sample temperatures is difficult.) This new technique also permits the bulk of the aerosol sample to be subjected to a fairly uniform supersaturation and temperature, whereas the two plate process involves a range of supersaturations across the chamber.

The advantages of this new method pointed out by the Reviewer were included in the manuscript at the end of section 2 (Page 31708 line 28 – Page 31709 line 4) and in Summary and Conclusion (Page 31713 lines 16 – 20).

The introduction is written as if to readers with no knowledge of this subject - if this is indeed the expected readership, then the introduction section is appropriate.

The style of the current introduction is in agreement with most of the papers published in ACP and other important journals in this area such as JGR, GRL, QJRMS, Atm. Env., etc.

The details of the most important measurement in these studies are not given. It is crucial that the measurement of RH is accurate, but there are no details of the device used to measure RH or its accuracy. Also, is RH measured inside the chamber or is it measured in the air to be injected, then the chamber RH is calculated from the cooling? If the device is inside the chamber, then reliability issues arise when measuring RH at temperatures below 0C.

We agree with the Reviewer that the description of the experimental device is crucial. Then, several paragraphs have been added and modified in section 2 of the manuscript, in order to give more details of the device and measurements (Page 31706 lines 18-26). The instruments used to measure RH were included and it was clarified that they were fixed inside the cloud chamber (Page 31705 line 25 – Page 31706 line 3).

This is a useful study involving a simple technique - if applied with care it has great promise.

There are various minor typographical errors.

Several typographical errors were detected and corrected in the manuscript.