

Interactive comment on “Ice supersaturations and cirrus cloud crystal numbers” by M. Krämer et al.

M. Krämer et al.

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To make it easier to read, the answers are written in blue.

Specific comments:

- 2) Line 20, p21102 to Line 7, p21103 and Figure 5. The way of choosing Nice and Rice separately (Figure 5) is a bit awkward. Why not plotting Nice*Rice instead and choose Min, Middle, and Max values of Nice*Rice directly?

We are aware that we could have chosen the NiRi directly, but we prefer to derive them from the original parameters, because we show the min, middle and max lines again later in Figure 9. For a better understanding to Figure 6, we added there a panel showing the NiRi-lines.

- 3) There is no clear mentioning of time resolutions. It is implied that 1-s data are used in Figures 1 and 2.

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The time resolution of the instruments is mentioned in the caption of Table 2, we added it now in the text:

2.1 Water vapour, '... vapour was determined simultaneously with the FISH and the FLASH, both closed cell Lyman- fluorescence hygrometers sampling at 1 Hz ...'.

I will be a bit surprised if this is the case, since to my knowledge both FISH and OJSTER are fairly noisy at 1 Hz and low water mixing ratios. The way authors treat the data (lines 10-15, p21096) suggests that the combined precision (RH_{ice} and RH_{ice,enh}) is better than 7%. Is this possible at 1 Hz?

We do not claim a combined precision better than 7%. In the wide range $RH_{ice,enh}/RH_{ice} = 1.07 - 1.3$ we state data points to be less confidently inside of cirrus, thus taking into account a poorer precision. Only if $RH_{ice,enh}/RH_{ice} > 1.3$ we confidently attribute a data point to be inside of cirrus.

- 4) Lines 15-16, p21090: Since actual *uz* was not measured (actually, *uz* history has to be known), the authors do not show a cause of high supersaturation, but a possible explanation.

We changed the sentence to: 'From the combined analysis - using conventional microphysics - of supersaturations and ice crystal numbers, we show that the high, persistent supersaturations observed inside of cirrus can possibly be explained by unexpected, frequent very low ice crystal numbers ... '

Minor comments

- 1) Line 23, p21092: 'artifact'

Done.

- 2) Lines 3-7, p21093. The description is not accurate.

3) Figure 2. Changing % to ratio for consistency.

Changed.

4) Line 21, p21096: 'observed data point' should be 'observed data points used in this analysis'?

Changed.

5) Line 18, p21102: define 'uz' here.

u_z is defined in line 7.

6) Figure 4: Legend is missing.

Corrected.

Interactive comment on Atmos. Chem. Phys. Discuss., 8, 21089, 2008.

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