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Atmospheric Chemistry and Physics Discussions

Interactive comment on "Mesoscopic surface roughness of ice crystals pervasive across a wide range of ice crystal conditions" *by* N. B. Magee et al.

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Magee et al present a study of surface roughness of ice crystals at high magnification using electron microscopy. In line with other recent work they show that surface roughness is ubiquitous to ice crystals grown under a range of conditions. I recommend the paper for publication in ACP with a few relatively minor corrections:

1. Section 3.3. It is stated that the transported crystals may have changed during transport, if so, how useful are these results. They don't seem to add anything greatly to the paper. Either justify their inclusion and make the conclusion clear or remove the

section.

2. Section 3.3, 8405 'Tabular'. Is this the correct name. Do you mean shorter columns. The name tabular refers to a special class of crystal. There is an illustration on p 42 of Tape (1994, Atmospheric Halos, vol 64, Antarctic research series). A tabular crystal is one in which a hexagonal column has two prismatic faces much wider than the other two.

3. P8404. The section on 'ice Ic/ice Ih combinations' not quite correct. The references are fully relevant, but are rather technical in nature. Revise this section to something closer to: 'Several recent studies have also suggested that ice up to 243 K does not have a well ordered hexagonal crystal structure. Instead ice can contain a mixture of cubic and hexagonal sequences which can give rise to roughness on the prismatic faces (Malkin et al., 2012; Kuhs et al. 2012). It has also been shown that the proportion of cubic sequences decreases as ice is heated and the ice tends towards perfect hexagonal ice (Murray and Bertram, 2006; Kuhs et al., 2012). Both of these. . . . . '

4. Fig 1-6. I encourage ACP to print these images as large as possible – i.e. full two column width. The details are central to the paper.

5. Fig 1-6. The scale bar and conditions is hard to read in many cases. Either include this information clearly in the figures or put in a table. Put scale bars on figures

6. Fig 5 caption: Add more detail of what this image is.

7. Figure 6 caption. More detail. What magnification. Are we looking at the prismatic or basal face. What does this look like on a lower magnification (include second inset image?)

Technical:

1. P8394. Reference new IPCC report?

2. P8395, ln 24. Brackets around '2010'.

3. P8399, ln 4, degree symbol missing from degree C.

4. When referring to the videos, which are very useful, refer to the specific file name in the text. At the moment it is not clear which video to look at in relation to various parts of the text.

5. 'SingleCrsytal' video doesn't work on my machine. All the others work. I was using QuickTime.

Interactive comment on Atmos. Chem. Phys. Discuss., 14, 8393, 2014.