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Reply to referee 2

The authors observed the growth and sublimation of ice crystals using ESEM at temperatures between -10 and -20°C (n.b. the preprint has many missing negative signs) and pressures with over-and undersaturation. They describe their observations by ESEM images.

This was a software problem, and the omission was corrected throughout the text.

Pressures below the typical surface pressure occur in the atmosphere, and the paper may be therefore relevant for the formation of ice crystals in clouds. The paper investigates with similar methods but at lower temperatures and different pressures ice growth and sublimation as in Chen et al. (2017).

The paper is of a very descriptive nature, comparing the observations with literature. The interpretation is based on comparing specific observations with other authors. The observations are described in detail. However, quantitative data (e.g. detailed figures on ice growth and sublimation rates of repeated experiments) are missing.

We agree that such data would be very valuable.

We measured local growth velocities at isolated and merging crystals shown in Figure 3. Measured values are reported together with Figure S1 (isolated crystals) and S2D (merging crystals) in the Supplement. For our set of parameters (moderate supersaturation) we obtain values up to 200 nm/s. The values can be separated into max 100 nm/s at the six edges of the basal plane, and 50 to 150 nm/s for some prism faces. Some edges, though, appear to be at least partially pinned, which is not due to contact with the substrate. However, some faces (e.g., the basal plane A1 in Figure 3) expand only very slowly at their edges, and practically not in their normal (90º from surface plane).

More detailed data would, however, require a completely new study that could not readily be compared to existing literature, specifically when ESEM or other imaging techniques are considered. In contrast, the literature on growth at much lower temperatures gives precise values, but is not relevant for our parameters, and it is very rarely focussed on imaging. The same arguments apply to sublimation rates.

I could not find a substantial conclusion. The author observed a transition from single crystal to polycrystalline film as their most relevant result. Such a result may be relevant for the icing of aeroplanes. However, ice crystals in the atmosphere are usually single crystals and do not grow on a substrate.

The paper is clearly structured although in parts lengthy. The first paragraph of the introduction is not relevant: ice on the ground is always at quite high atmospheric pressure. The only relevance of this paper is for ice clouds. If deposition and sublimation occur with the same morphology a higher air pressure is not clear and is not discussed in this paper.

We rewrote introduction and conclusion, which we believe are now addressing the issue better. We also mention that the atmosphere plays a decisive role for ice fields; albeit we present data at much lower pressure, our temperature and humidity conditions do apply.

The authors seem also not aware that ice at a temperature of -20°C is actually at a very high homologous temperature (about 8% below the melting point). The "low temperature" is only on a Celsius-temperature scale.

The "low temperature" is correct w.r.t ESEM experiments, but to avoid confusion for readers who work at temperatures well below -40ºC, where neither supercooled water nor the quasi-liquid layer should play a role, we decided to avoid this term.