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Atmospheric Chemistry and Physics Discussions

Interactive comment on "The Quasi-Liquid Layer of ice revisited: the role of temperature gradients and tip chemistry in AFM studies" *by* Julián Gelman Constantin et al.

Julián Gelman Constantin et al.

longinot@qi.fcen.uba.ar

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Supplement to Interactive comment AC1 on "The Quasi-Liquid Layer of ice revisited: the role of temperature gradients and tip chemistry in AFM studies" by Julián Gelman Constantin et al. Reply to RC1: 'Referee Comment to acp-2017-1213', Anonymous Referee #1, 06 Jul 2018

The authors deeply thank the appreciative comments by Anonymous Referee #1. Regarding the specific questions:

1. From the experimental part it is not clear what type of ice is used. Is it amorphous

or crystalline? If crystalline, what is the surface phase? What is the surface structure?

Answer: We did not intend to prepare ice single crystals and study specific face orientations, since these are not the kind of samples expected to find in environmental conditions. Our preparation method (similar to that of other experiment) surely produces polycrystalline ice. As we detail in section 2.4, water vapor was deposited at slow rates (oversaturation lower than 120 %), and the ice layer was stabilized for 10 to 20 minutes prior to measurement. Deposition conditions are close enough to ice-vapor equilibrium conditions to ensure ice crystals are formed (instead of amorphous ice). Stabilization time is enough to allow ice crystals to reach equilibrium or near-equilibrium conditions (when vapor pressure is controlled).

2. Along the same lines; in overviewing the literature in the text and in Fig. 1 the type of ice is not mentioned. The authors should elaborate a bit on it.

Answer: We thank the referee for the remark. Indeed, differences in ice sample preparation are possibly another contribution to the large discrepancies between different experiments. We remarked that on the manuscript. We also add a new reference regarding this topic (an article based on a conference proceeding cited in the former version of this manuscript).

3. For non-AFM experts like me, it would be very helpful to connect Fig. 5 and Table 1 by marking in the figure the d_jump-in and the indentation slope.

Answer: Thank you for your suggestion, we modified Fig. 5.

4. The caption of Fig. 5 is missing important information. It should make clear what the difference between the center and bottom panel is. It is apparent from the text, but not from just reading the figure caption.

Answer: We tried to clarify the differences between both panels, even though a caption might not be enough to capture all the differences.

Please also note the supplement to this comment:
https://www.atmos-chem-phys-discuss.net/acp-2017-1213/acp-2017-1213-AC1-supplement.pdf

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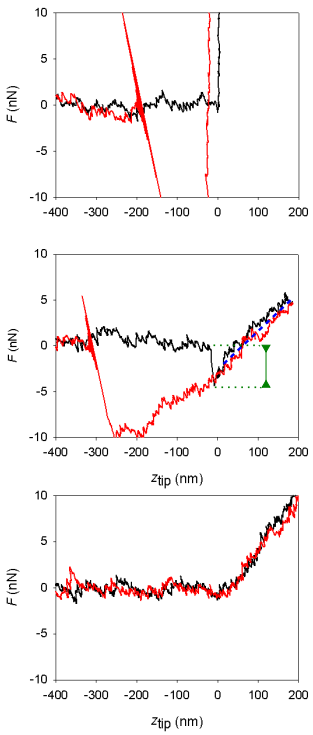

Fig. 1.