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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.

Anonymous Referee #1

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This paper presents AFM results on the ice-air interface in order to determine the thickness of the quasi-liquid layer which is an important question for understanding amongst others atmospheric processes. The authors overview the current literature very well and show that there is a wide variety of QLL thicknesses obtained with AFM. In the current manuscript the authors describe AFM experiments performed in a very small chamber with controlled temperature and humidity. In this way they show that temperature gradients are very important. Small temperature gradients yield a small QLL thickness. Moreover, the hydrophobicity of the tip is playing a role. Based on their results, the inconsistency in literature data could be explained. The paper is well written and the conclusions are well supported by the data. After considering the comments

below, I recommend publication in ACP.

Specific comments:

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?

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.

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.

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.

Interactive comment on Atmos. Chem. Phys. Discuss., https://doi.org/10.5194/acp-2017-1213, 2018.

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Discussion paper