

***Interactive comment on “Technical note:
Fundamental aspects of ice nucleation via pore
condensation and freezing including Laplace
pressure and growth into macroscopic ice” by
Claudia Marcolli***

Anonymous Referee #1

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This is a good paper and correctly categorized as a technical note as it does not contain considerable new scientific findings. It follows on several papers, including several by Marcolli et al., and the advance here is that it provides a more comprehensive treatment of the theory of pore condensation freezing than in previous works. As a technical note it represents an important resource and should be highly referenced by those working on this ice nucleation mechanism. It should be published with minor changes.

Some suggestions for the author to consider:

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1. The introduction only discusses cirrus clouds as the application of pore condensation freezing. The author may consider if other systems might be impacted, e.g. those beyond the atmosphere. 2. Also in the introduction, can it be stated that homogenous freezing via pore condensation does not exclude heterogeneous mechanisms? The term ‘prevailing mechanism’ in line 28/29 makes it unclear if the author is suggesting this is the dominant mechanism (which I do not believe has been shown) or one of several depending on specific conditions (which I believe is the consensus). A sentence or two to clarify would be helpful. 3. Given the density of equations in Section 2 and after, it would be helpful to have a table with variable definitions in the paper, e.g., Appendix A and then use B for the derivations / parameterizations. 4. The use of Figures 1 and 11 is appreciated for clarify on the specifics of pore modeling, this will be of help to the broader readership of this Technical Note. The author may consider moving Figure 11 earlier in the paper as a description of how this mechanism is impactful on the atmosphere. 5. I concur with the point made by Reviewer 2 regarding significant figures, e.g. Section 3.1.1 in the equations and perhaps this could be incorporated into a table or another Appendix.

Interactive comment on Atmos. Chem. Phys. Discuss., <https://doi.org/10.5194/acp-2019-973>, 2019.

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