

Response to comments of reviewer #2

P. Spichtinger, P. Marschalik, M. Baumgartner,

We thank the reviewer for pointing out a weak formulation.

We list the reviewer's comments (in blue) below together with our responses. We also added a track change version of the respective changes.

Main point:

The authors reasonably argue that the nucleation rate of droplets with activity at water saturation should match that of pure liquid water. What is not clearly explained, in my opinion, is that the original Koop et al., 2000 formula was already derived from this requirement (cf Koop et al., 2000: "Assuming this to be the case also for other values of J , we can compute $J(\text{Daw})$ by fitting to the tabulated J -values of pure water $J(a_w = 1)$ ".) Hence, the current inconsistency solely results from the change in the expression of the nucleation rate of pure water. This should be clarified.

We added some text for clarification.

Figure 1: Could you remind the reader which supercooled liquid water saturation vapor pressure is used to compute J_{sol} . (Though I assume it does not matter too much in that T range.)

We added a sentence about the relevant formulae.

Line 253: (related to the main comment) this statement is misleading, since the original nucleation rate formulation by Koop et al. was constructed to fit the homogeneous nucleation rate of pure water

We have deleted some parts of this statement and added some text for clarification as mentioned above.