

## ***Interactive comment on “Radiative consequences of low-temperature infrared refractive indices for supercooled water clouds” by P. M. Rowe et al.***

### **Anonymous Referee #1**

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“Radiative consequences of low-temperature infrared refractive indices for supercooled water clouds” by Rowe, Neshyba, and Walden is a succinct paper that clearly demonstrates that accurate radiative transfer modeling of cold super-cooled liquid water clouds should include more precise treatment of the temperature-dependence of the refractive index of water. The paper does not tell the complete story, but shows that there is a strong foundation for further work on this topic.

My review is so brief because the paper is quite good. I recommend publication after a few minor revisions listed below.

1. The paper is not consistent with the use of the word “Section” or of abbreviations.
2. Section 5.4 requires some clarification. The discussion of retrieved ice fraction is  
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difficult to follow because the phase retrieval methodology is not referenced. Please reference the phase retrieval method and summarize it, including the relevant ice microphysics assumptions.

3. Figure 2 caption: Please make clear in the caption the refractive index reference temperature (or temperatures) used in Figure 2. Also, the in-figure inserted text “a) Upwelling” and “b) Downwelling” does not match the caption.

4. Figure 5 caption: The figure axes say ice fraction and ice effective radius, yet the caption does not make clear that this is a mixed phase cloud with fixed liquid water properties. Please make the caption more descriptive.

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Interactive comment on Atmos. Chem. Phys. Discuss., 13, 18749, 2013.