

Interactive comment on “First Odin sub-mm retrievals in the tropical upper troposphere: ice cloud properties” by P. Eriksson et al.

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Firstly I would like to say that the paper is mostly very good. There are two aspects I particularly like, firstly the use of two channels to constrain cloud height, and also the use of two particle size distributions to give a best estimate and lower limit on ice water path. However I think there are minor improvements that could be made in clarifying the paper, which I will describe in this comment. Also there is one major scientific concern, which I will raise in another thread. There are numerous english/grammar problems; page 8695 stands out in this respect, but I assume that this is not the right forum to bring this up and that it will be dealt with by the editor.

p8682

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I think the first sentence is too strongly worded. The CloudSat cloud profiling radar has no trouble penetrating thick clouds and returns an ice water content product. Yes, multichannel mm/sub-mm has some advantages over the CPR, but I think that is as much as you should say.

line 9: you have given the detection threshold (4 g/m^2) without actually defining what it is you are measuring (ice water path over 12.5 km)

p8683 line 28: The Wu et al reference was published in 2006 and is not "in press"

p8689 line 28: For clarity it might be better to say "The uncertainty in ΔT_b corresponding to the choice of assumed RH_i is $\sim 1\text{K}$ "

p8690 line 23-24: Clarity: "The variation of ΔT_b with altitude ..." instead of "The altitude variation ..."

p8692 line 10 (and Figure 7): Surely it would be more instructive to label this line ≤ 13.5 km instead of NaN ?

line 12 onwards: The description of the "retrieval response" could be made clearer; preferably with a mathematical definition. Given that you have a map between ΔT_b for the two frequencies and IWP, it isn't clear from the text why this response is required.

p 8693 line 18: It would be helpful to define "mean cloud detection frequency"

p 8694 line 6: ".. while most probable values are based on the MH97 PSD". The term "most probable" implies a retrieval scheme more rigorous than that presented, for instance a Bayesian retrieval scheme. I suggest you replace "most probable" with something like "best current estimate".

p 8695 from line 8 on. I think this discussion on retrieval error has serious deficiencies, which I will address in another thread. Added to that there are several English/grammar problems.

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