

Atmos. Chem. Phys. Discuss., community comment CC1  
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## Comment on acp-2021-154

Louis Rivoire

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Community comment on "Impacts of tropical cyclones on the thermodynamic conditions in the tropical tropopause layer observed by A-Train satellites" by Jing Feng and Yi Huang, Atmos. Chem. Phys. Discuss., <https://doi.org/10.5194/acp-2021-154-CC1>, 2021

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Quick comment about a reference to results in Rivoire et al. (2020) near line 350: Figure 5(c) in Rivoire et al. (2020) illustrates the role of clear sky longwave radiation, which isn't directly relevant to a discussion about the effect of clouds on radiation. However, Figure 5(b) in Rivoire et al. (2020) could be referenced since it provides cloudy sky longwave radiative heating rates (most directly comparable to the first panel in Figure 11 in the present manuscript). Note that Figure 5(c) in Rivoire et al. (2020) makes the distinction between different kinds of cirrus-containing atmospheric columns, showing that longwave cirrus warming in the UTLS is strongest when cirrus are the only clouds in the column (which only happens in  $\sim 10\%$  of the data set), and that the presence of other cloud types beneath UTLS cirrus clouds produces reduced cirrus warming or even cirrus cooling (which both occur in  $\sim 30\%$  of the data set).

I think that the paragraph starting at line 348 could be rephrased a bit to reflect these comments. For instance, the statement that no cirrus warming is found in Figure 11 could be rephrased since Figure 11 does not isolate cirrus effects, and also given that longwave warming does occur near and just above 100 hPa outside the 200 km radius in Figure 11, where cirrus clouds are very frequent (see e.g. Figure 3(a) in Rivoire et al., 2020). The statement that longwave radiative heating rates are mostly invariant with radius could also be nuanced since there is a vertical and radial dependence, and since Rivoire et al. (2020) arrived at similar results but also noted the strong dependence of cloud radiative effects on cloud type and cloud type combinations (similar to Figure 12 here), which show a radius dependency in tropical cyclones