

Interactive comment on “Tropical cirrus and water vapor: an effective Earth infrared iris feedback?” ***by “Q. Fu et al.”***

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One of the reviewers stated that this paper was less important because other work (e.g. Hartmann and Michelsen, BAMS, 2001, in press) has shown that the data analysis contained in the original Lindzen et al Iris Hypothesis paper did not really show a negative correlation between tropical convective anvil cloud area and SST. Although the data does not show any evidence that anvil clouds shrink in area with increasing SST, it is still meaningful to ask the question of what such a correlation would mean for climate sensitivity if it did exist.

Fu, et al. show that the model analysis of Lindzen et al greatly exaggerates the potential importance of this feedback for two very straightforward reasons; The clear-sky OLR contrast between moist and dry regions in the tropics is overestimated by at least 60%, and much of the negative feedback comes from an assumption that low

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clouds in the warm tropics have a strong negative cloud forcing. Observations from ERBE show that the net radiations in convective and non-convective regions of the warm tropics are about equal to each other, and that the net radiative forcing of low clouds over warm SST is only about 10 Watts per meter squared, even though the clouds cover about 25% of the area. So the contribution of cloud radiative effects to the feedback should be zero. The potential importance of a sensitivity of anvil cloud area to SST is therefore much less than Lindzen et al have estimated with their model analysis.

Interactive comment on Atmos. Chem. Phys. Discuss., 1, 221, 2001.

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