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Atmospheric Chemistry and Physics Discussions

# *Interactive comment on* "Impact of different definitions of clear-sky flux on the determination of longwave cloud radiative forcing: NICAM simulation results" *by* B. J. Sohn et al.

**Anonymous Referee #2**

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This paper deals with the estimation of longwave cloud radiative forcing from model outputs and the associated limitations when compared to satellite products. The paper is compact and clearly written. It conveys the point of the authors very efficiently. The overall result of the study is of importance to the climate community. I recommend publication after minor comments are adressed:

1) How such an "clearsky vs. cloud free" error compares with the sampling error found in the satellite products when monthly mean CRF are concerned. I suggest to provide an error budget for the satellite CRF (for instance for CERES e.g. Wielicki et al., BAMS, 1995) and to discuss the present source of error with respect to it.



2) I am not comfortable with the statement that "10% of the total longwave CRF should be added ". I think it is better to convey to the readers that an error of 10% is to be expected with the present computations of CRF in the longwave. Indeed one can easily imagine running from the full resolution model outputs, a broad band radiative transfer model "off-line" and hence computing the clear sky OLR as the satellite would have done. Such comparisons would hence not suffer from the present error. Please discuss how the off-line approach would permit having more consistent satellite and models comparisons.

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Interactive comment on Atmos. Chem. Phys. Discuss., 10, 22093, 2010.