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Atmospheric Chemistry and Physics Discussions

Interactive comment on "Synergetic use of millimeter and centimeter wavelength radars for retrievals of cloud and rainfall parameters" *by* S. Y. Matrosov

S. Matrosov

sergey.matrosov@noaa.gov

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Response to comment 1. It was added in the conclusion discussion that in future, the suggested remote sensing approach can be applied for longer data sets collected at the TWP Darwin ACRF. This can be done in a manner as the approach specifically tailored to the SGP ACRF instrumentation was applied to the whole warm season of 2007 (as described in the 2009 article published in J.Geophys.Res.,114,D22201, doi:10.1029/2009JD012004). Currently, the algorithm for identifying stratiform type precipitation is not automated and each case is examined manually. It is planned to automate this algorithm. It will be easier to do so for the tropical sites (compared to

mid-latitude sites) because the height of the freezing level varies relatively little in the tropics. As soon as the bright band for a stratiform case is identified, the retrieval is fairly automatic.

Response to comment 2. As suggested, the revised manuscript now states that parameters a and b for a particular case are calculated using all the data from this case. It is also now mentioned that Delta-Z is calculated for each C-POL RHI profile. Changes in delta-Z from profile-to-profiles are typically within a few tenths of a dB ($\sim$0.3$\sim$0.4 dB).

Response to comment 3. For considered here events, a chosen conservative level of 4 km AGL at the Darwin site during the wet period is usually a couple of hundred meters lower than "true" bottom of the melting layer. The reviewer is right: a possible underestimation of CLWP due to this factor is much less than the stated uncertainty of CLWP retrievals.

Response to comment 4. In the revised manuscript this sentence was changed as suggested.

Response to comment 5. In future, it is planed for the TWP ARM Darwin site to use CloudSat simultaneous retrievals of IWP and mean rain rate and ARM ground-based retrievals for comparisons. CloudSat and ARM retrievals of cloud and rainfall parameter retrievals have been so far compared for the vicinity of the ARM SGP site (the corresponding study is currently under review).

This reviewer also provided 9 technical comments dealing with suggestions to improve text indicating editorial suggestions and pointing out typos. All these suggestions were have been incorporated in the revised manuscript.

Interactive comment on Atmos. Chem. Phys. Discuss., 10, 947, 2010.