REVIEWER#1 COMMENTS

The authors have done an excellent job in this revision, and I am willing to accept it. On the way to publication, I will point out that on the original review I missed the statement (now on L.513-514) that TMPA uses the TRMM PR. This lack of light-end sensitivity is precisely why the TMPA developers instead used the Combined Radar-Radiometer Algorithm, as the authors correctly describe earlier in this manuscript. That leaves you with jumpiness in the Combined, or in the microwave retrievals (all done with the then-current version of GPROF), or in the IR scheme, or in the switching between microwave and IR at successive timesteps.

➔ We are grateful to the referee for the positive assessment and for identifying this error. The referee is correct that TMPA does not rely on the PR alone. As described in Sect. 2.2, the research product calibrates the individual PMW estimates against the TRMM Combined Instrument, which merges TMI and PR (product 2B31), and the Combined Instrument estimates also enter the 3-hourly field directly whenever TRMM overpasses a grid box (Huffman et al., 2007). Attributing the overestimated variance to the PR sensitivity was therefore inconsistent with our own description of the algorithm. We removed this statement. This has been revised in the revised manuscript (Lines 515–519).

"In contrast, TMPA overestimates the variance. It retains PMW estimates where available and fills the remaining grid boxes with IR estimates calibrated against the PMW estimates (Huffman et al., 2007). The data source at a given grid box can therefore switch between PMW and IR across successive 3-hourly time steps, potentially introducing source-dependent differences in the statistical properties of the resulting time series. In addition to this source switching, variability in the TRMM Combined Instrument estimates used both as input and as the calibration reference, as well as variability associated with the PMW retrievals from the Goddard Profiling Algorithm and the IR estimates, may contribute to the excess variance."