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Hydrology and Earth System Sciences
Discussions

Interactive comment on "Daily evaluation of 26 precipitation datasets using Stage-IV gauge-radar data for the CONUS" *by* H. E. Beck et al.

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I read this discussion paper with great interest, and we discussed some of the results in the Hydrology Working Group at the NASA Precipitation Measurement Missions Science Team meeting this week.

I applaud the authors on a comprehensive evaluation effort, and the results are useful for answering the questions posed by the authors.

From a GPM perspective, one of the critical questions not answered by this analysis is the extent to which the errors are related to detection issues or bias issues. In Tian et al., JGR, 2009, we introduced a component analysis of errors where we quantified 3 orthogonal components of error, E: Hit Error (H), Missed Precipitation (M) and False

Precipitation (F).

These independent components sum to the total error:

E = H - M + F

Like this study, we used Stage IV data as a reference, and in addition to producing maps of the total error and components for several products, we also found a significant seasonal cycle in these errors.

I think this reference is a critical one for this paper, and I strongly suggest that the authors dig deeper into the sources of error by computing these error components.

From Tian et al., 2009: "The relation E = H - M + F raises a critical point. It implies that it is not enough to look at the total bias E as an indicator of the performance. The three individual components H, M, and F could have larger amplitudes than the total error E, but they could cancel one another, resulting in total bias smaller than some of the components. This is especially true for M and F, which always have opposite signs. Therefore it is important to realize that the amplitude of the total bias alone is not enough to serve as a measure of the performance of a set of estimates; one needs to look at the three components as well to truly understand the error characteristics. "

Further, as can be seen from Figures 2 and 3, the errors have a pronounced seasonal cycle. An investigation of the seasonal cycle of errors would also be a useful extension of the previous work.

Reference: Tian, Y., C. D. PetersâĂŘLidard, J. B. Eylander, R. J. Joyce, G. J. Huffman, R. F. Adler, K. Hsu, F. J. Turk, M. Garcia, and J. Zeng (2009), Component analysis of errors in satelliteâĂŘbased precipitation estimates, J. Geophys. Res., 114, D24101, doi: 10.1029/2009JD011949.

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