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Hydrology and Earth System Sciences
Discussions

Interactive comment on "Evaluation and Comparison among Multiple Forcing Data Sets for Precipitation and Shortwave Radiation over Mainland China" *by* Fan Yang et al.

Anonymous Referee #1

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This manuscript evaluated precipitation and shortwave radiation for three datasets: GLDAS, CLDAS and CMFD, where the latter two were created by Chinese scientists. My main concerns are the selection of the "truth" for evaluation, and the superficial analysis. The manuscript is not to create a new dataset, so simple comparison does not guarantee a publication in HESS. There are several comments below.

Major comments: 1. While the evaluation for radiation has some novelty given that the authors use several observation networks (CERN, HiWater and TPE) that are independent from the CMA data, the evaluation for precipitation is less credible. As far as I know, CLDAS used over 30,000 ground observation merged with CMORPH for precip-

itation, while the reference data used in this study (i.e., CN05.1) was only interpolated from 2000 stations. So, which one do you believe that is more close to the reality? I guess most people would buy CLDAS. In addition, CMFD was also basically interpolated from 740 stations, so it is not surprise that CMFD might be closer to CN05.1 than the CLDAS. So the fundamental issue is: which one is the truth for precipitation?

2. The second major issue is the resampling. As compared with GLDAS, the advantage of CLDAS and CMFD is their high resolution. So the evaluation should be conducted across scales, i.e., they should be verified against station observations besides at 0.25-degree resolution. Even for the gridded comparison conducted in the manuscript, the Nearest Neighbor resampling method is not suitable. The Nearest Neighbor is useful for comparing gridded data with station data, while for the comparison between two gridded datasets, bilinear interpolation or the inverse quadratic distance weighting method would be more appropriate.

3. The third major issue is the superficial analysis. An arbitrary conclusion that "In summary, precipitation estimates of CMFD and GLDAS are more credible and CMFD outperforms CLDAS and GLDAS in shortwave radiation estimation over mainland China" is definitely not enough for a HESS paper. The manuscript needs to answer why one dataset is better than another to provide more insights for the data production community. Alternatively, it should provide some in-depth comparison, for example, long-term trends, inter-annnual variability and extremes. The authors had a good start to show the temporal variations, but the new findings, if there are, should be concluded in the abstract.

Minor comments: 1. As the paper mainly focus on dataset evaluation, detailed introduction for different datasets should be provided to help distinguish them. For instance, CMFD uses GLDAS precipitation to replace TRMM 3B42 north to the 40°N which makes CMFD has the same background with GLDAS in that region. And, GLDAS also uses TRMM 3B42. Will this similarity influence the result?

2. P3L29, CLDAS-v2.0 covers the area of 60-140E and 0-65N. So I believe the manuscript used CLDAS-v1.0. Anyway, a more detailed description of CLDAS is needed.

3. P5L13, Xin et al. 2013 should be Li et al. 2013.

4. In terms of spatial comparison, are there any seasonal differences besides the annual precipitation? How about some daily statistics (e.g., rainfall frequency, intensity, dry spells)?

5. The radiation results are more convincing, and the different sources for three datasets make the comparison more meaningful. But some discussions can be given on why CMFD outperforms.

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