Comment on essd-2021-456
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Here is my review for “CAMELE: Collocation-Analyzed Multi-source Ensembled Land Evapotranspiration Data” by Li et al. This manuscript evaluates 5 different uncertainty estimation techniques using both synthetic tests and flux-tower observations. It shows that EIVD outperforms other uncertainty quantification method. Based on the uncertainties of different ET products, a newly merged ET product is proposed.

Overall, I think this is a very interesting paper with solid materials and is a significant contribution to the field of ET uncertainty and merging studies. I would recommend acceptance after considering my comments:

- Line 30: ET error is larger at 0.25 spatial resolution. Could it be the representativeness error of flux towers?
- Line 50: “lots of” consider to change it into a more appropriate word in scientific writing.
- Lines 82, 83 and elsewhere: revise the format of the citations.
- Line 87: “double” => “double instrumental variable algorithm”
- Lines 250 to 264: a significant portion of this paragraph should be placed in the introduction.
- Line 283 and elsewhere: please enumerate the equations
- Section 3.2: The merging is aimed to address random errors. The biases should be explicitly handled. However, this is not clear in the current manuscript.
- Line 461: There are several products clearly violates the assumptions of TC/QC/IV. For instance, ERA5, GLEAM and GLDAS are all model-based. It is clear that these products should not be used together. Therefore, why Table 4 reports all-method-averaged
metrics, instead of only the metrics from “reasonable” product combinations.
- Section 4.12 and 4.2: I think they are better suited in the results section.
- Section 5.1: which method is used here?
- Figure 11: as commented above, the biases of different products should be removed first, before merging. It may not affect correlations, but will have some impacts on RMSE.
- Figure 15: likewise, the merging is aimed to reduce random errors and is not expected to improve trends. Theoretically, we should remove all the systematic differences of the parent products prior to merging.