



## Comment on **essd-2022-171**

Anonymous Referee #1

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Referee comment on "A global terrestrial evapotranspiration product based on the three-temperature model with fewer input parameters and no calibration requirement" by Leiyu Yu et al., Earth Syst. Sci. Data Discuss., <https://doi.org/10.5194/essd-2022-171-RC1>, 2022

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This manuscript addresses a useful but challenging topic. Although there are many remotely sensed global or regional evapotranspiration (ET) datasets, their performances varied across different biomes or regions due to high uncertainty exist in ET estimates. The current manuscript provides a good try to retrieve a land ET product in 2001-2020 using a three-temperature model without resistance and parameter calibration, which is different from the available ET products generated by methods including Penman–Monteith equation-based and surface-energy-balance-residual-based methods. The validation performed at different scales sound good. The intent of the manuscript is worthy and significant, and the topic generally fits the scope of the Earth System Science Data. The manuscript is well-written, and the methods, results, and discussion are clearly presented. Seeing the potential of this, I am in general supportive of publication after minor revision.

Specific comments.

The numbers in front of the comments indicate page and line number.

- It may be better to clearly state the temporal resolution and duration of the product.
- Please add the data points used for validation.
- "the energy balance product" is better changed to "the ET product".
- PMLv2  PML. Missing a PT-based ET product, GLASS.
- Fluxcom also has no value in some arid regions.
- It is better to provide a journal article as the thesis may not be available.
- "G equals to 0.315Rn" may be misleading.

- The subscript  $l$  is not consistent with those in equations 10 and 11.
- Order of the section title was wrong as well as the following section. The authors should proof read the manuscript to avoid such mistakes.
- TWSC is better replaced with  $\Delta S$ . In L171, it is better to use annual TWSC.
- Typos (the unit). The authors should proof read the manuscript to avoid such mistakes.
- The value 133 mm/yr was from what data?
- It seems the ET should be removed.
- PMLv2 looks curious. "v2" may be the version number, suggesting delete it across the entire manuscript but remain a statement somewhere.
- It is better to clearly state that the EC datasets are the same as those used in figure 2.
- Texts in the figures are too small to read. I suggest the authors enlarge these texts to improve their quality and readability.
- What does "PFT" mean? Please consider define such abbreviation.
- "the whiskers indicate the extreme values" should be "the whiskers indicate the outlier values".
- Area of the Antarctica should be wrong.