

The Tibetan Plateau is the birthplace of Asia's major rivers and is also essential to the Asian energy and water cycles. This manuscript aims to produce a long-term (1982-2018) evapotranspiration product to accurately monitor and understand the spatial and temporal variability of the ET components. The intent of this study is meaningful, and the scope is suitable for publication in Earth System Science Data. However, I also have some concerns about the method and results presented in this study. So I suggest a major revision is needed before publication.

Major comments:

1) The Introduction is generally well written, but the scientific problem of lacking longer-term remote sensing ET products in TP needs to be more evident. It would help readers know why you did this study, the problem of ET products in TP, and how to solve these problems. In addition, the characteristics of TP and required model improvements for TP should be explained in the Introduction.

2) MOD16-STM is utilized in this study, but readers don't know the abbreviation of STM, please give its full name. Three ET components are considered in Eqs. (1) to (3), but the surface resistance r_s in E_c , E_s , and E_i should be designed reasonably for dry vegetation, wet vegetation, and bare soil, respectively. Eq. (5) is the soil heat flux calculation, but the final term equation should be $I_s - I_c$. Eq. (7) is the calculation of aerodynamic resistance, but the zero plane displacement (d_0) is not included in the equation, more details please find in Liu et al. (2007).

Shaomin Liu, Li Lu, Defa Mao, and Li Jia. Evaluating parameterizations of aerodynamic resistance to heat transfer using field measurements. *Hydrology and Earth System Sciences*, 2007, 11 (2): 769-783.

3) Section 3.4 presented the comparison of MOD16-STM products and other ET products in TP, but readers don't know the spatial pattern difference among different products.

4) The improvements of the proposed model compared with the MOD16 algorithm should be discussed in-depth.

Minor comments:

1) Line 40, 'During the study period, the ET exhibited a significant increasing trend, with rates of about 1–4 mm/year ($p < 0.05$), over most parts of the central and eastern TP and a significant decreasing trend, with rates of –3 to –1 mm/year, over the northwestern TP'. Please reorganize this sentence.

2) Lines 118-119, how to determine the climate zones, please provide necessary references.

3) Figure 1, all these figures belong to the classification diagram, so the color bar should not be continuous.

4) Line 144, how to calculate F_{wet} ? Are any empirical parameters that need to be calibrated following the studies of Mu et al. (2011, RSE)? How to calibrate these parameters?

Mu, Q., Zhao, M., Running, S.W., 2011. Improvements to a modis global terrestrial evapotranspiration algorithm. *Remote Sensing of Environment*. 115, 1781-1800.

5) Line 155, what does "surface model" mean?

6) Some grammar mistakes are included, e.g., Line 200, 'domwnload' should be 'download'; Line 330, 'increase' should be 'increased'.

7) Line 210, the URL and necessary references should be added in Table 1.

8) Table 1, the spatial resolution of model input data and auxiliary data is greater than 0.05° . Can the 1km ET products provided in this study capture more spatial details after resampling?

9) Line 225, ECR is calculated in Eq. (18), why not use ECR in Eq. (19) ?

10) Line 231, accuracy evaluation may be more appropriate.

11) Line 265, the legend needs to be added to Figure 4.

12) Lines 292-293, the E_s in Ma et al. (2022, AFM) is nearly 226, and E_c is almost 110, please explain the differences.

Ma, N., Zhang, Y., 2022. Increasing Tibetan plateau terrestrial evapotranspiration primarily driven by precipitation. *Agricultural and Forest Meteorology*. 317.

13) Line 353, are you sure their RMSE values are under 0.006 mm/d?

14) It is quite strange why the NDVI and wind speed have different trends after 2000? Detailed explanations need to be provided into the manuscript.

15) The conclusion is too long to understand, please shorten them to make it more readable.