

Comment on **essd-2022-131**

Anonymous Referee #1

Referee comment on "Global land surface 250-m 8-d fraction of absorbed photosynthetically active radiation (FAPAR) product from 2000 to 2021" by Han Ma et al., Earth Syst. Sci. Data Discuss., <https://doi.org/10.5194/essd-2022-131-RC1>, 2022

The authors develop a deep learning model to generate the new version of global 250 m spatio-temporal continuous GLASS FAPAR product. This product has great application potential as it is the first 250-m product and has the highest validation accuracy among existing FAPAR products according the evaluation results.

The paper gives details of the model, data, and product validation. Although the authors have done a good job, some modifications are needed to further their manuscript. Please see below for my specific comments:

- Reference for Ameriflux should be given.
- L222: In 2000, MODIS reflectance has no data before DOY49, did it affect the estimates in 2000? If added other 500-m bands, how the model accuracy changes?
- In Fig. 4, the meaning of P values should be explained.
- In Fig.6, "Direct validation of (the a) MODIS" should be "Direct validation of the a) MODIS".
- How does the author aggregate the 250-m FAPAR to 500-m and 3-km? If using all MODIS surface reflectance bands to estimate 500-m FAPAR, can the accuracy be improved?
- From Fig. 9, the GLASS V6 FAPAR was smoothed, did the author reprocess the estimated FAPAR curve, or the training samples are inherently smooth? How to reprocess them?
- In Fig. 7, please check the number of the sub figures. The range of legend should be 0-1.
- In Fig. 9, note the legend of field FAPAR (two triangles)
- 9: Do these four FAPAR products have the same definitions?
- L210: What is the resolution of input GLASS V6 LAI and output FAPAR? The input MODIS surface reflectance is 250 m, the output FAPAR should be also 250 m. How to get the 250-m FAPAR samples?
- The GLASS V6 LAI product has uncertainty, the error will be brought into the estimation model. If only MODIS reflectance is used for training data, this error can be ignored, the accuracy of FAPAR maybe improved.

