**Comment on essd-2022-5**

Anonymous Referee #1

Referee comment on "Mapping long-term and high-resolution global gridded photosynthetically active radiation using the ISCCP H-series cloud product and reanalysis data" by Wenjun Tang et al., Earth Syst. Sci. Data Discuss., https://doi.org/10.5194/essd-2022-5-RC1, 2022

This manuscript produced a long-term and high-resolution global gridded PAR product based on the latest ISCCP-HXG cloud product and reanalysis data. PAR data is required for researches in the ecological, agricultural, and global change fields. The algorithm used to estimate PAR in this study is the physical scheme that used in the previous study of Tang et al. (2017), and was proven to be a more accurate algorithm than previous ones. The produced gridded PAR product was evaluated against surface observations collected at more than 80 experimental stations worldwide. Compared with the well-known CERES PAR product, the PAR product produced in this study was found to be a more accurate dataset with higher resolution. The topic is highly interesting and appropriated for ESSD. The paper is clear and well written. Therefore, I recommend its publishing on the ESSD after answering the following several minor issues.

- In this study, aerosol data from the reanalysis data MERRA-2 was used? Why not use the satellite-based aerosol products with higher accuracy?
- Cloud top temperature was used to discriminate the water and ice cloud in this study. Since MODIS has a cloud top temperature product, and why not use this product?
- In section of in-situ measurements, seven experimental stations from SURFRAD, 42 experimental stations from NEON, and 38 experimental stations from CERN were used to evaluate the performance of the estimated PAR. Did you do quality control on these observations and what are the criteria for control?