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Interactive comment on "Long time series of daily evapotranspiration in China based on the SEBAL model and multisource images and validation" *by* Minghan Cheng et al.

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The authors have done a terrific job on this important contribution assessing actual ET over China land cover types using a long time series (2001–2018). They have provided a remarkable and complete and current assessment of the literature as well as provide the computational component in detail. They have compared an ET product based on SEBAL and multisource images for ET estimated using MOD16 data. They conducted a comprehensive validation of the product and compared its performance under different environmental conditions in China. They conclude that the ET product generated using SEBAL showed a good performance in China. They also provide next steps and explain the reasons for having these next steps. For example, nicely stated: "the improvement of the SEBAL algorithm will be the focus of follow-up research. Moreover,

the 1 km spatial resolution of the SEBAL ET product cannot meet the requirements of more detailed research. Due to the difficulty of simultaneously satisfying the requirements for the spatial and temporal resolutions of remote sensing data, the fusion of multiple sources of remote sensing data may be the most effective way to improve the spatiotemporal resolution of daily ET products." This provides the reader with a good understanding of what is still lacking/needed after this research which depicts four major contributions to the literature.

I have noticed only a few editorial corrections that need to be made, such as on pg. 25, the word "to" was left out "Compared the widely used MOD16 ET data,..." I have only one question that I would like to see them address in the text. Figure 11d shows SEBAL as a bi-modal curve whereas the summary histogram (Sebal in red) shape shows a low and wider distribution than MOD16 (blue). I'm wondering why SEBAL data is in fact bi-modal and the reasons for this need to be discussed. This is the only minor change I have other than to read it carefully for editorial mistakes.

Here is their own summary of their findings: Compared to flux tower observational data, the r-value of the SEBAL ET reached 0.79 for 9896 samples. Based on observational data from eight flux towers from 2003 to 2010, the ET datasets estimated using SEBAL and MOD16 were validated at the 8-day scale for different land cover types, climate zones, terrain types, and seasons. The results showed that SEBAL performed best in the conditions of forest cover (rRMSE = 38.08%), subtropical zones (rRMSE = 32.32%), hilly terrain (rRMSE = 32.32%), and the summer season (rRMSE = 36.56%), respectively, and performed worst in the conditions of grassland 520 cover (rRMSE = 52.63%), warm-temperate zones (rRMSE = 53.95%), plain terrain (rRMSE = 53.95%), and the winter season (rRMSE = 66.92%), respectively. Based on flux tower observational data and hydrological observational data, the ET estimated by SEBAL and MOD16 were validated at the point-scale and basin-scale. The results showed that, at the point-scale, the accuracy of SEBAL was 7.77 mm/8 d for the RMSE, 44.91% for the rRMSE, and 0.85 for the r-value. Overall, the SEBAL ET is higher than the MOD16 ET:

for 84.07% of the total area of China, the SEBAL ET showed higher values. Additionally, the SEBAL ET is closer to the in-situ measured ET in most conditions. Compared the widely used MOD16 ET data, the SEBAL ET product showed a higher accuracy and temporal resolution, but it still has a daily error of 42.04% (0.92 mm/d) at the point-scale and a yearly error of 19.15% (91.39 mm/year) at the basin-scale.

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