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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.

Anonymous Referee #2

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General comments:

The study presents an approach of estimating long-term time series of daily ET in China by using the SEBAL model. In the current form, the manuscript lacks the literature to justify the need for the current study and several critical information related to SEBAL processing and ET validation. For example, there is almost no study reported in the introduction section that was conducted in China. There are several studies that used SEBAL and other surface energy balance (SEB) based models to estimate ET at a field and regional scales across different land covers and climates in China. Also, the authors did not report the critical information in the methods section such as the

selection of hot and cold pixels for the SEBAL processing. This is one of the main steps for the SEBAL model processing and the results may vary based on the different approaches applied (manual selection or automated selection). In addition, for the pixel-scale validation, the authors missed to report the quality of flux tower data and any approaches (e.g. constant Bowen-ratio, residual LE closure, ...) applied to close the energy balance. These details are very basics and the core for any study related to SEB-based ET estimations. Without this critical information, it's difficult to warrant the validity of ET estimated from the current study.

Specific comments:

Section 2.2: lengthy model description. . .move it to appendix

Line 190-195: explain the gap-filling (spatial and temporal) process for pixels impacted with cloud

Line 196: any modification applied to MOD11 band for Ts adjustment?

Fig 3: could be moved to appendix

Line 223: describe the quality of flux tower data and any filtering applied to remove bad observations

Section 2.4.1: validation with flux tower and water balance would suffice

Fig 4: add the time series plots as well. . ..provide more information for monthly/seasonal/annual variations

Fig 5: any obvious reason for ET underestimation for higher ET rates from SEBAL (for all land covers)?

Fig 8: discuss the seasonal overestimation/underestimation from SEBAL. . ..what are the primary driving factors?

Section 4.2.1: this section doesn't explain the quality of input data for the current study.

The QA/QC of input data is fundamental for ET modeling but this information is missing. The reference cited in line 425 is related to GPP.....not relevant to conclude that the quality of GMAO data was not accurate enough for ET modeling.

Section 4.2.2: this section is not discussing about the quality of flux tower data included in the current study...mostly literature.....not helpful to link with the results reported

Line 432: report the error from the flux towers considered in this study

Line 443: report the footprint of flux towers used in this study...this is critical for point-scale validation

Line 445: any explanation about overestimation during winter? Also, discuss the SE-BAL overestimation at lower ET rates and underestimation at higher ET rates in Figure 7 and Figure 8

Section 4.3.2: not relevant to discuss the results from SEBAL, could be removed

Line 490-495: report the spatial (tiles/basins) and temporal (study years) variation of hot and cold pixels .....would be helpful to link with the reported results

Line 490-499: the sources of errors related to H estimation can be evaluated with instantaneous H from flux tower...this would help to identify where the errors are coming from (maybe from modeled Rn and G too).....along with the quality of input data and flux tower data

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