

# ***Interactive comment on “Estimation of evapotranspiration through an improved daily global solar radiation in SEBAL model: a case study of the middle Heihe River Basin” by Jingqiu Yin et al.***

**Anonymous Referee #2**

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The authors discuss improvements to the calculation of the daily global solar radiation, e.g. a more detailed approach to account of the atmosphere and topography. The calculation is, subsequently, used in combination with the SEBAL method to determine the actual evapotranspiration. SEBAL with the improved global solar radiation method is applied to the Landsat TM image and MODIS products collected from June 21 – 24.

The manuscript is in general written in understandable English. That being said I find that the core innovation of the manuscript (e.g. improved of daily global solar radiation) more an atmospheric than a hydrological topic. I do not find myself qualified enough to

have an opinion on the improvement made w.r.t. the daily GSR. The application of the GSR to the ET estimation with the SEBAL algorithm for a few days I find insufficient and also written in an insufficiently reproducible manner to merit publication in Hydrology and Earth System Sciences.

My major comments are the following:

- 1) The reason why SEBAL was chosen to perform the actual ET calculation is unclear. Daily GSR calculation has implications all types of ET calculation. Why not use a simpler method such as Priestley & Taylor, or Penman? That will make discussion of the effect daily GSR on the ET less disturbed by the potential to actual evapotranspiration.
- 2) The SEBAL algorithm is applied to a very limited number of days in 2009. If you are promoting an improved to the daily GSR calculation, I would like to see its effect on the ET calculation over a long time period, e.g. at least two years.
- 3) The application of the SEBAL algorithm is insufficiently described. SEBAL requires the selection of a 'wet' and 'dry' pixel. The authors should describe how they did this.
- 4) Equations for the error metrics (MABE and MARBE) need to be given in the manuscript.
- 5) The employed in-situ measurement need to be described in a more transparent manner, e.g. for each measured quantity provide the instrument and the expected accuracy of that instrument. With respect to the ET measurements also the energy closure gap need to be reported.

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Discussion paper

