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Interactive comment on "At which time scale does the complementary principle perform best on evaporation estimation?" *by* Liming Wang et al.

Anonymous Referee #3

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Complementary evaporation relationships have been studied at multiple time scales, which time scale is the most suitable one? In this respect, the manuscript gave very meaningful results. It is recommended that the draft should be revised on the following questions before publication.

(1). Ln172-173, Ln458-459, "When all the E/Epen values were less than 0.9, alpha was set as the default value of 1.26". This default value is problematic for the PGC model. The independent variable of PGC model is Epo/Epa = alpha*Erad/Epen, which is less than or equal to 1. When alpha =1.26, the range of Erad/Epen values is only 0-0.79. However, if alpha =1, the range of Erad/Epen values is 0-1. It could be imagined that the PGC can not fit the data points with 0.79<Erad/Epen<1 if the alpha =1.26, but there is no problem in the case of alpha =1.

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(2). Ln294-295, Ln336-337, Ln351-352,Ln466-467, The manuscript gave a conclusion that the parameter c of PGC model decreased with the increase of time scale. The parameter c was determined under the condition of a fixed alpha in this study, which needs to be specially explained. When the c is a fixed value, say 0, the alpha would change with the month (Liu et al.,2016).

(3). By using statistical indexes such as determination coefficient, the manuscript considered that the complementary relationship of a monthly scale was the best, but the other time scales were not poor and reached to a very significant level too. Does this mean that the complementary relationship on other time scales also exists significantly, not as Morton (1983) said, only at longer timescales?

(4). Ln23, “globle water and energy cycle”. Generally, water can have a cycle, but energy flows only.

References Liu, X., C. Liu W. Brutsaert.2016. Regional evaporation estimates in the eastern monsoon region of China: Assessment of a nonlinear formulation of the complementary principle. Water Resources Research, 52: 9511-9521. Morton, F. I. 1983. Operational estimates of areal evapotranspiration and their significance to the science and practice of hydrology. Journal of Hydrology, 66(1-4):1-76.

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