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Hydrology and Earth System Sciences
Discussions

Interactive comment on "Energy fluxes and surface characteristics over a cultivated area in Benin: daily and seasonal dynamics" *by* O. Mamadou et al.

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The manuscript of Energy fluxes and surface characteristics over a cultivated area in Benin: Daily and seasonal dynamics of Mamadou et al. gives a detailed overview of the year-round forcing and flux/vegetation response of a Western African Monsoon site.

I found the paper extremely interesting, with lots of important results. The paper very well describes the different stages of the Monsoon and what are the most important features of the boundary layer and surface responses. I have very much enjoyed the

manuscript and recommend it for publication. Thank you for this nice contribution. It is quite rare to find manuscripts with such level of details, verification and quality. I have especially liked the detailed discussion of the flux partitioning and possible errors during the different monsoon stage, as well as the soil and stomatal conductance.

I have very few comments: - p10619: could you point for other type of errors like boundary layer entrainment and inactive eddies penetrating till the surface layer: in your case I think this can be discarded and seems to be more related to vegetation and possible ground heat flux but may be worth a discussion given the boundary layer depths in those regions. Regarding ground heat flux, you might be interested in our paper "Gentine, P., B. Heusinkveld, and D. Entekhabi (2012), Systematic errors in ground heat flux estimation and their correction, Water resources Research, 48, doi:10.1029/2010WR010203" since in this region the subdiurnal variations in ground heat flux are quite drastic. - p 10622: reformulate sentence: The soil evaporation was also able to contribute as the 0–30 cm soil water storage was still slightly decreasing during this period (Fig. 2 g). and During period P3 (Fig. 8c), the occurrence of rainfalls changed drastically both atmo- spheric and surface conditions; the annual vegetation has grown p10623: you might be interested in this review showing how stoata can be open at night in C3 and C4 plants: Caird, M. A., J. H. Richards, and L. A. Donovan (2006), Nighttime Stomatal Conductance and Transpiration in C3 and C4 Plants, Plant Physiology, 143(1), 4–10, doi:10.1104/pp.106.092940. - space missing between 2 sentences: This explained the out-of-phase pattern already observed on energy budget closure (Fig. 5d).This p10626: explain why the conductance are in series

Again thank you for this very nice paper.

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