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Hydrology and Earth System Sciences Discussions

Interactive comment on "Determining irrigation needs of sorghum from two-source energy balance and radiometric temperatures" *by* J. M. Sánchez et al.

Anonymous Referee #3

Received and published: 8 July 2011

% —— overview

This manuscript describes they use of a surface energy balance model driven by meteorological data and radiometric surface temperature to estimate the evapotranspiration of sorghum. These estimates are compared to records of precipitation and irrigation and lysimeter measurements which together give an independent estimate of evapotranspiration.

The manuscript is well written. Thank you for your careful work, this manuscript was easy to review as compared to others. The only weakness is that the work, although

well conducted and executed, does not seem to contain any significant results. Although I am not an expert in this area, it appears to me that the only thing original about the research is the specific physical setting. But I believe that the research is worth publishing as another example of this line of research, which in my understanding, fits the aims of this journal.

% —— introduction

3939:29 Please explain why SEBAL requires heterogeniety in surface moisture conditions, and therefor not applicable to small fields.

% ——- study site and materials

The final height of the sorghum is nearly 5 m! What do you think the rooting depth is? Is the lysimeter deep enough to account for the depth of the roots?

% ——— model description

Please explain why it is necessary to make a distinction between r_aˆh and r_aˆa, and then how they are different. Specific mathematical expressions are needed for each. In the Norman et al. paper they are the same. From your definitions of the two variables, they seem to be the same to me.

In (7) the sky does not fill the entire upper hemisphere that the soil "sees." A large fraction of this hemisphere, when the vegetation fraction Pv is greater than about 0.5, is occupied by the vegetation canopy. Longwave emission from the vegetation canopy could be much higher than the longwave emission from the sky, espeically on clear days. Please explain why you can neglect emission from the vegetation that is incident on the soil surface.

3946:14 Please explain what the "effective emissivity" is. I assume it is the surface emissivity, but it should be clearly stated.

3946:17-20 This sentence needs to be rewritten, I do not understand it in its current

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form.

3947:8-10 Strictly speaking, the wind used in the model should have been measured over the sorghum. Please justify why you are able to use data from an adjacent field, considering the fetch of these instruments.

3947:11 Please justify use of the value 0.2.

3948:18 suggest "underestimate by"

3948:25 Please be consistent with your use of the "+ or -" notation.

% ———— Figure 4

These subplots are difficult to read because they are so small. Consider making the height of each subplot larger. The time axis is ok.

Interactive comment on Hydrol. Earth Syst. Sci. Discuss., 8, 3937, 2011.