

Interactive comment on “Estimation of Evapotranspiration and Other Soil Water Budget Components in an Irrigated Agricultural Field of a Desert Oasis, Using Soil Moisture Measurements” by Zhongkai Li et al.

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Response to Anonymous Referee #1 (RC1)

General comments

The manuscript uses timeseries of soil moisture data to estimate the soil water budget components, especially evapotranspiration, in an irrigated agricultural field of a desert oasis. This study is well conducted, and the authors responded the comments well. I think it is worth publishing after minor revisions. I have several comments listed

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as below.

RESPONSE: We warmly thank the Anonymous Referee #1 for the overall favorable impression of the work, and for his or her thorough review and the detailed, helpful comments. Please find below your reproduced comments, followed by our point-by-point responses.

Specific comments 1) The anonymous reviewer 3# concerns the locations of Section 3.1, 3.2, and 3.3, and the authors insisted the former locations. I think the problem may be arisen by the title of them. The current titles may be misleading to about the dataset, nor the observed or calculated results. For example, Section 3.2 is about calculated irrigation amount. The meteorological data should be introduced in the materials section.

RESPONSE: We have reorganized the sub-titles of Section 3 as: “3.1 Soil hydrophysical characteristics”, “Soil moisture dynamics (SMDs)”, and “3.3 Soil water budget components (SWBCs)”. The results about irrigation amount has been merged into section “3.3 Soil water budget components (SWBCs)”, and the descriptions upon meteorological data has been moved to “2.3 Calculation methods, 3) Boundary setting and data collection”. Thanks to the nice suggestion, this part looks much better than before.

2) I am confused by the S_{stop} and S_{max} . Is S_{stop} larger than S_{max} , as shown in Fig. 2.

RESPONSE: Very nice question, and the answer is: S_{max} is larger than S_{stop} . As we mentioned in “2.3 Calculation methods 1) Water storage and irrigation amounts”, S_{max} was defined as the recorded maximum soil water storage of the root zone, and S_{stop} is the recorded soil water storage when irrigation event ends (moisture of uppermost soil layer starts to decrease). Although the real water storage in root-zone soil should keep constant during the short periods between irrigation ends and deep drainage starts, it is not naturally been recorded by the soil moisture sensors at any time of this period, because of the continuously redistributing soil water profile and limited number of soil

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moisture sensor. In this work, the real water storage in root-zone soil was assumed to be equal to S_{max} , and thus S_{stop} would tend to approach S_{max} if more soil moisture sensors were installed in the soil profile. To clarify this point, more detailed explanation of this point will be included in the revision.

3) Please check the captions appeared in the text. For example, Fig.7 appears earlier than Fig. 5. Where is Fig. 6?

RESPONSE: We feel very sorry for the careless. "Fig. 7" appeared in Section 3.2 has been replaced by "Table 3" in the text, and we further checked all the figure captions to avoid any other similar mistakes.

4) Fig.3, It is better to shown the specific irrigation amount and compare it with rainfall event.

RESPONSE: Thanks for the suggestion, Fig.3 will be reorganized to include the average amount of each irrigation event in the coming revision.

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