

Interactive comment on “Evaluation of Penman-Monteith model applied to a maize field in the arid area of Northwest China” by W.-Z. Zhao et al.

Anonymous Referee #1

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Compared with the observed latent heat fluxes, the manuscript evaluated two stomatal resistance models for evapotranspiration estimation with Penman-Monteith model. The results are helpful for the determination of key parameter in Penman-Monteith model and significant in field and regional evapotranspiration estimation.

There are below suggestions.

(1) The English writing is poor. It is better to revise the manuscript by people whose native language is English.

(2) Some variables were represented by different symbols. For example, the bulk canopy resistance was represented by r_c at line 16 and 20 in page 5, while it was

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represented by r_s at other places. Also, VPD in the sentence at line 2 in page 14 hasn't been defined. I think that VPD is vapor pressure deficit, while it is represented by D_s in the paper. It's better to use the same symbol for a variable.

(3) There are several mistakes in the manuscript.

1) The expression “ $F_2 = 1$ when $w_2 > w_{wilt}$ ” in equation (5) in page 6 should be “ $F_2 = 1$ when $w_2 > w_{cr}$ ”.

2) The sentence “where r_{smin} is the maximum stomatal resistance ($s_m - 1$)” at line 10 in page 6 should be “where r_{smax} is the maximum stomatal resistance ($s_m - 1$)”.

3) The sentence “The large gaps were filled were filled by means of the look-up table approach or, if not possible, by the by the mean diurnal variation method (Falge et al., 2001)” at line 21 in page 11 should be “The large gaps were filled by means of the look-up table approach or, if not possible, by the mean diurnal variation method (Falge et al., 2001)”.

4) The sentence “maize filed under the arid climatic condition” at line 20 in page 14 should be “maize field under the arid climatic condition”.

5) The sentence “reaching the maximum value near mid-day (13:00 LT) during the different stages of maize growing season” at line 7 in page 15 should be “reaching the minimum value near mid-day (13:00 LT) during the different stages of maize growing season”.

(4) The ratio between w_{cr} and w_{sat} was taken as 0.65 at line 5 in page 7. It is different from the value of 0.75 in the reference paper. Why?

(5) How the values of saturated soil water content w_{sat} , wilting point, and the species-dependent empirical parameter β are determined (at line 7 and 10 in page 7)?

(6) The sentence “The levels with the leaf orientations of east, west, north and south were selected to represent the 25% of the canopy” at line 20, page 12 is difficult to

understand.

(7) Does “small level-basin irrigation” at line 25 in page 14 mean “small basin-level irrigation”?

(8) Figure 5a shows that most of dots are below 1:1 line. It means that J-D approach underestimated the bulk canopy resistance, which is contrary to the conclusion “From the MBE given in Fig. 5, it can be seen that the J-D approach overestimated the bulk canopy resistance” (line 17, page 14). Why? Is the figure correct?

(9) The paper attributed the reason why the bulk canopy resistance is larger in the morning than that in the afternoon to “both the increase of water vapour deficit and the more intensive solar radiation in the afternoon” (line 12, page 15), which is inconsistent with the conclusion that the conductance decreases with the increasing vapor pressure deficit (Fig 2). It’s better to revise the explanation.

(10) The paper said that “Under the dry soil condition before irrigation, the J-D approach overestimated the bulk canopy resistance in the midday” (line 12, page 15). But figure 5 shows that the J-D results are very close to the measured value in the midday at about 13:00.

(11) In order to consistent with the figures and paragraphs in the paper, I suggest changing the title of 4.4 “Simulation of evapotranspiration” at line 21, page 15 to “Simulation of latent heat flux”. It is the same for the title of Figure 7.

(12) The titles of Fig. 2, 3, and 4 (stomatal resistance) are inconsistent with the titles of y-axis (stomatal conductance). It’s better to change the figure title ‘stomatal resistance’ to ‘stomatal conductance’.

(13) It is said that “The maize field for this study was sufficiently supplied with water, and the soil water content were generally above 0.27” (line 17, page 16), what is the unit of soil water content?

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