Hydrol. Earth Syst. Sci. Discuss., 7, C461–C463, 2010
www.hydrol-earth-syst-sci-discuss.net/7/C461/2010/

Hydrology and Earth System Sciences Discussions

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 #2

Received and published: 11 April 2010

General comments:

The manuscript evaluated two canopy resistance models using eddy covariance data. It is an interesting work, and the result may be helpful to improve the key parameters of P-M model in arid regions. However, this paper still needs a major revision.

Major comments:

(1) Eq. (2) is not reasonable. The stability correction function and roughness length for heat transfer should be derived for half-hour data. Please see Thom (1975) and Liu et al.(2007).

(2) Eq.(11) is not right. Please check it.

(3)Does the post-processing of flux data contain all the necessary corrections? Such as convert sonic temperature to actual temperature correction, frequency response correction, etc.

(4) The gaps of flux data have been filled by LUT or MDV method in the manuscript. Are these filling data used in the comparison in Fig.7? If the answer is yes, it is not suitable.

(5)The maximum air temperature is more than 46°C in Fig.4, it is too high. The site maximum temperature is 39.1°C in the site description (section 3.1).

(6) How many is the Energy Balance Ratio (EBR) of flux data in Fig.7? When the measured and simulated latent heat fluxes are compared, the EBR should be taken into account.

(7) Both of the two canopy resistance models are in agreement with the measurements under the dry soil condition, while under the wet soil condition, there are large scatters for J-D model in Fig. 7. Please explain it.

Minor comments:

(1)There are many writing mistakes in the manuscript, and some sentences are not fluent. Page 462, line 6: “P-M mode” should be “P-M model”; Page 468, line 15-16: “Tsk=298” should be “Tsk=298K”; Page 470, line 27: “50 m apart”, what’s meaning? Page 476, line 23: “and inversely is the case when soil was wet after irrigation”, the sentence should be “and inversely when soil was wet after irrigation”.

(2) Do Ts in Eq.(6) and Tc in Eq.(12) represent surface/ leaf/canopy temperature? How to measure them?

(3) The instrument introduction of EVINS Environmental Monitoring system in page 471-472 seems confusable. I suggest a table should be listed.

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7, C461–C463, 2010

References:

Thom, A.S. Momentum, mass and heat exchange of plant communities, In:Monteith, J.L. Vegetation and the Atmosphere, Academic Press, London,1975,57–109.

Shaomin Liu, L.Lu, D.Mao and L.Jia: Mvaluating parameterizations of aerodynamic resistance to heat transfer using field measurements, Hydrology and Earth System Sciences, 2007, 11(2), 769-783.

Interactive comment on Hydrol. Earth Syst. Sci. Discuss., 7, 461, 2010.