Hydrol. Earth Syst. Sci. Discuss., 7, C4095–C4097, 2010
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Hydrology and Earth System Sciences Discussions

Interactive comment on "Measurements of energy and water vapor fluxes over different surfaces in the Heihe River Basin, China" *by* S. Liu et al.

Anonymous Referee #2

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Comments on "Measurements of energy and water vapor fluxes over different surfaces in the Heife River Basin, China" by S. Liu, Z. Xu, W. Wang, J. Bai, Z. Jia, and J. Wang (Hydrol. Earth Syst. Sci. Discuss., 7, 8741-8780, 2010)

1. General comments: I recognize that this paper cost the authors many years' labor, but I am sorry I have to point out some flaws that should be corrected. Further, I'd like to suggest that the annual variations in water balance at the three sites situated in irrigated cropland, alpine meadow and spruce forest in the Heihe River basin should be focused on a little more, because it could give this paper its originality more.

2. Specific comments: (1) Evapotranspiration (ET) is closely connected with other water balance components such as rainfall, irrigation and capillary rise, and hence not

only ET but also other water balance components should be analyzed and discussed as well. At least, seasonal variations in precipitation should be shown in “3 Results and discussion”. (2) About Table 2: Does “Monthly G0” mean the cumulative heat flux at the soil surface in a month? If so, it is strange that it was positive all through the year, because, if the monthly Rn was positive, the result suggests that the ground absorbed heat on a yearly basis. If energy balance is made, we have LE/Rn + H/Rn + G0/Rn = 1 However, numerical values listed in Table 2 do not met this demand. Is this imbalance “the energy imbalance of EC” you write in this paper? Further explanation of this phenomenon should be given in this context related to Table 2. (3) About estimating G0: You made measurements of soil heat flux at a depth of 0.05 m and of soil temperature at depths lower than 0.05 m. Thus, when estimating G0 by Eq. (8), you need to assume the depth profile of soil temperature in the upper 0.05 m. How you determined the temperature profile (using the surface temperature measurement Ts?). The accuracy of the estimates of G0 made by the method should be discussed, because it seems to have a large influence on your results. (4) About Eqs.(7) and (8): If z and Gz are defined as positive downward, integral and summation should be done from z = 0 to z = zr, which seems to be the opposite in direction to that these equations say. The time interval Δt used in this calculation also should be mentioned (30 min ?). (5) About Fig.4: If G0 were underestimated, the coefficient a would also be underestimated. You emphasize that all of the instruments were calibrated and carefully maintained, but your description “the soil heat flux . . .was already considered (p.8755, 23-24)” does not succeed in emphasizing the reliability of G0.

[Supplement] English abusage and questions: In a table some expressions corrected for English abusage in this manuscript are listed only as a suggestion, because I am not an English-speaking person like you. Sentences which I could not get clearly the meaning of are also represented by âĽł??âĽń. I hope this list will be a help to you for improving the manuscript.

Please also note the supplement to this comment:

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http://www.hydrol-earth-syst-sci-discuss.net/7/C4095/2010/hessd-7-C4095-2010-supplement.pdf

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Interactive comment on Hydrol. Earth Syst. Sci. Discuss., 7, 8741, 2010.