

Interactive comment on “Estimating surface fluxes over middle and upper streams of the Heihe River Basin with ASTER imagery” by W. Ma et al.

X. Li (Editor)

lixin@lzb.ac.cn

Received and published: 14 October 2009

The authors have made sufficient revisions according to the reviewers' comments. I therefore would suggest that the paper should be published with minor revision.

Besides the reviewers' comments, I have one major comment and some minor comments.

Major comment: The discussion and conclusions are not sufficient enough. For example, one of the reviewer has indicated the “Energy balance non-closure is a big issue in the experimental study of the near-surface layer of the atmospheric boundary layer”. However, this issue was not discussed in the revised paper. Since the disclosure of

C2367

energy balance by EC observation will potentially have great impacts on the evaluation of remotely sensed estimations. I would suggest the authors to read the following two papers and made corresponding discussion. [1] Wang JM, Wang WZ, Liu SM, Ma MG, and Li X, 2009. The problems of surface energy balance closure-An overview and case study. *Advances in Earth Science*, 24(7): 705-713. [2] Shuang X, Liu SM, Xu ZW, and Wang WZ, 2009. Investigation of spatial representativeness for surface flux measurements in the Heihe River Basin. *Advances in Earth Science*, 24(7): 725-733.

Minor comments”

1. In abstract, Change “SEBS method based on ASTER data and field observations has been proposed and tested for deriving net radiation flux . . .” to SEBS method has been proposed and tested for deriving net radiation flux . . . using ASTER data and field observations.

2. In abstract, “Heihe River, northwest China”→ Heihe River Basin, northwest China

3. P2, line 1 (λE) → (λE)

4. Change (Li, X., 2008) to Li et al., 2009 Li, X., Li, X. W., Li, Z. Y., Ma, M. G., Wang, J., Xiao, Q., Liu, Q., Che, T., Chen, E. X., Yan, G. J., Hu, Z. Y., Zhang, L. X., Chu, R. Z., Su, P. X., Liu, Q. H., Liu, S. M., Wang, J. D., Niu, Z., Chen, Y., Jin, R., Wang, W. Z., Ran, Y. H., Xin, X. Z. and Ren, H. Z.: Watershed Allied Telemetry Experimental Research, *Journal of Geophysical Research*, doi:10.1029/2008JD011590, 2009.

5. Derived directly from satellite observations (e.g., Susskind et al., 1984; Che'din et al., 1985; Tucker, 1986; Wan and Dozier, 1989; Menenti et al., 1989; Becker and Li, 1990, 1995; Watson et al., 1990; Baret and Guyot, 1997; Price, 1992; Kahle and Alley, 1992; Li and Becker, 1993; Qi et al., 1994; Norman et al, 1995; Schmugge et al., 1995; Kustas and Norman, 1997; Sobrino and Raissouni, 2000; Su, 2002; Ma et al., 2003a; Ma et al., 2003b; Oku and Ishikawa, 2004; Kato, 2005; Ma, 2006b, 2007, 2009). Just keep the major references.

C2368

6. P3, "Only the point scale study (e.g., Jia et al., 1999, 2000)" is not a full sentence.

7. P4. Change "In this study, the SEBS retrieval algorithm is used for the ASTER data to evaluate of algorithm applicable in an arid and cold environment (Su, 2002)." to In this study, the SEBS retrieval algorithm is used to evaluate of algorithm applicable in an arid and cold environment using the ASTER data (Su, 2002).

8. P7, "The regional soil heat flux derived from the relationship between soil heat flux and net radiation flux is suitable for heterogeneous land surface of the WATER area, because the relationship itself was derived from the same area." What is the meaning of "relationship itself was derived from the same area". Seems some references are needed.

9. Result 4 should be moved to the section of conclusions and discussion. "The derived regional sensible heat flux and latent heat flux at the validation sites in the WATER area is in good agreement with field measurements (Figure 4). This is due to the fact that atmospheric boundary layer processes have been considered in more detail in our methodology and the proposed parameterization for sensible heat flux can be used over the upper streams of the Heihe River Basin area. Latent heat flux is in good agreement with field measurement because of adequate parameterization of net radiation flux R_n , soil heat flux G_0 , sensible heat flux H ."

10. Figure caption of Fig. 4. "over the Watershed Airborne Telemetry Experimental Research". WATER should be Watershed Allied Telemetry Experimental Research.

11. Fig. 1 needs to refer to Li et al., 2009. Additionally, the experimental area of WATER is not so big (red block in the map of China.). Please make it accurately.

12. The authors need to reply the comment by Dr. Haginoya's on 2009/09/29.

Interactive comment on Hydrol. Earth Syst. Sci. Discuss., 6, 4619, 2009.