Hydrology and Earth System Sciences Discussions

Interactive
Comment

Interactive comment on "**Influence of thermodynamic soil and vegetation parameterizations on the simulation of soil temperature states and surface fluxes by the Noah LSm over a Tibetan plateau site**" *by* **R. van der Velde et al.**

Anonymous Referee #2

Received and published: 29 March 2009

This is an interesting paper describing the ability of a LSM to simulated heat fluxes and soil temperature profiles of a high altitude grassland.

Some issues should be addressed before publication in HESS.

Data set:

It is not clear who made the in situ observations at the Naqu site. The authors? Has a

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description of this data set been published before ?

Tuned parameters:

On p. 460, it is stated that "From the data record of Naqu station a 7-day 15 period from 3 to 10 September 2005 has been selected for this investigation." Why those 7 days? Why not working with the entire data set ? Have the authors verified that the best-fit parameters, valid for this period, do not lower the scores for other periods ? I tend to believe that 7 days are not enough to get sufficient confidence in the optimised parameters (especially for the physiological parameters). In particular, I don't think Topt should be tuned. This value should be derived from the literature or from the flux measurements. In Europe, most altitude grassland present a Topt of about 10°C (e.g. Gilmanov et al., 2007, Agric. Ecosys. Environ., 121, 93-120, doi:10.1016/j.agee.2006.12.008).

P. 474: "Parameters Rgl and Hs characterize optimum transpiration conditions in terms of the incoming solar radiation and humidity, which are bounded by physical constraints and not expected to 20 be significantly different for the Tibetan Plateau. On the other hand, the Rc,min and Topt are parameters more related to plant physiology and could be significantly different for the selected site." I would not say that. Rgl and Hs are as much related to plant physiology as Rc,min and Topt. Note that the optimal Rc,min may account for errors in the prescribed LAI (5 m2m-2 ?).

Site specific results ?

It is shown that improving the representation of soil processes close to the surface (by adding another layer) has a limited influence on the overall model performance. Is there any reason to think that this result is specific to this site (and why) ? It is likely that other processes are badly represented by the model. Some of them are listed in the discussion section. Have those shortcomings been identified previously, on other sites?

Equations:

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Eq. 2: how is Kih determined ?

Eq. 15: what is the meaning of theta ?

Typos:

- p. 474, L. 11: "by adopting"?

- p. 475, L. 27: "the represents"

- p. 478, L. 11: "the adding"

- p. 498: "except"?

Interactive comment on Hydrol. Earth Syst. Sci. Discuss., 6, 455, 2009.

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