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Hydrology and Earth System Sciences Discussions

Interactive comment on "Research on evaporation of Taiyuan basin area by using remote sensing" *by* X. Jin et al.

F. Jacob (Referee)

frederic.jacob@esa-purpan.fr

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Interactive comment by Frederic Jacob on hessd-2004-0019 "Research on evapotranspiration of Taiyuan basin area by using remote sensing" by X. Jin, L. Wan, and Z. Su.

————————- General comments ————————-

This paper deals with the evapotranspiration (ET) mapping over the Taiyuan Basin in the context of hydrological assessment. The paper is scientifically very poor: the bibliography check on ET mapping from remote sensing is erroneous, both citations and reference section include several errors, the land surface parameter retrieval is poorly described, the model to be used for ET mapping is poorly described (which is not consistent with the details given for method implementation), the result and discussion section has no interesting insight and is very poor. Overall, the study has no interest. I

have the feeling the authors did a "copy - paste" of a given procedure, without deeply analyzing the used method on both its potentials and limitations in the context of ET mapping from remote sensing. In this context, I recommend a complete rejection.

———————— Detailed comments ————————

[Abstract]

1rst paragraph: what is the interest of ET mapping in the context of hydrological assessment for the Taiyuan basin?

[1. Introduction]

Introduction is supposed to give several references when presenting the study context.

Why ET is important for water resource evaluation? Because it is a key component for water cycle and further water budget. Also, it is not required for crop production only, but also for crop water consumption and irrigation scheduling.

I do not understand why local ET measurements can not be extended to large areas because of the dynamic nature of heat transfer processes.

I strongly disagree with the differentiation between ET models. From my knowledge, there are three types of method: empirical (simplified relationship), deterministic (SVAT modeling) and semi-empirical (mainly residual approaches). Within the semi-empirical package, you have spatially differential method (SEBAL, SEBI) and temporally differential methods (disALEXIS). As far as I know, SEBS is a temporally differential approach since the dry and wet conditions correspond to the possible extreme cases for a given surface. In this context, I do not think the main SEBS feature is being designed for heterogeneous landscape. Further, Bastiaanssen (1995) proposed a intermediary model which is not index based: it is a residual approach. The widely known index based model is SEBI and its simplified version S-SEBI. You cite Su and Menenti 1999 whereas the reference section gives Su et al 1998 dealing with the application of SEBAL at the European scale.

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You claim SEBS is one of the most logical and precise method for ET mapping in China. I am skeptic with this statement. Indeed, model performances are related to the environmental conditions they are applied. If claiming SEBS is the best method, you have to provide a full bibliography check and analysis.

[2. Study area]

What means "strip-shaped loess mesa"?

[3. Method]

I do not know relative evaporation.

Equation 3. Which variable corresponds to 8.64E7?

How are computed Rn, G, H and LE. This should be mentioned for a better comprehension of the "computational process" section and the flowchart of Figure 1.

[4. Datasets]

The projection is Universal Transverse Mercator (UTM), not Transverse Mercator only. Also, give the zone code if you want to mention technical details.

Subsections and sub-subsection 4.1, 4.1.1, 4.2, 4.2.1, etc... are useless. One paragraph for satellite data processing, and one paragraph for meteorological data processing.

You explain NOAA/ AVHRR data were converted into planetary reflectance. And then, how do you derive surface reflectance and further albedo? I guess you applied atmospheric corrections and NTB conversion, otherwise I do not understand.

What is the feasibility of your strategy for the meteorological data interpolation ? I guess this depends on the spatial sampling provided by the local network. What is this spatial sampling? Further, what are the main features (on a spatial interpolation aspect) of the Distance Weighting Algorithm? Any reference?

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Interactive Comment

Sometimes you use past, sometimes present and sometime future. To be homogenized.

The part dealing with data conversion would be clearer if the model was better described in the relate section. Generally, you present equation with some numerical values. The latter should be defined, for instance, when dealing with thermodynamical variables.

The citation Lu and Su 2002 is not in agreement with the reference list.

The land surface parameter retrieval is not explained. This makes the paper difficult to understand.

[5. Results and discussions]

It is surprising you obtained surface temperature values around 0°C (mention units when dealing with numerical values of land surface parameters). I guess this is linked to the fact you deal with mountainous areas. But without correcting relief effects, it does not make sense to consider your results over these mountainous areas.

In section 5.5., obviously the evaporative fraction ranges between 0 and 1.

Overall, this section described spatial distributions without deep analysis. This makes the section having no scientific interest. Without either validation or sensitivity study, there is no reason for publishing this study.

Similarly, it is obvious to obtain similar distributions for the main model inputs and outputs, as you report in conclusion.

[Figures]

Figure 1 is full of technical acronyms. It is not possible to understand it.

Figure 5 and 6: the legend cannot be understood.

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