Hydrology and Earth System Sciences Discussions

Interactive
Comment

Interactive comment on "Evaluation of the Surface Energy Balance System (SEBS) applied to ASTER imagery with flux-measurements at the SPARC 2004 site (Barrax, Spain)" *by* J. van der Kwast et al.

Anonymous Referee #2

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General comments: The research makes an exploration on how to effectively estimating evapotranspiration based on the SEBS over the highly heterogeneous Barrax using ASTER remote sensing observations. The SEBS model is one of the best models developed over last decade for accurately estimating daily ET. With a sound base of physics, this model has been successfully applied by many researchers. The author also evaluates two scenarios of the SEBS model with distributed flux measurements at the landscape scale. What is a significant advance from previous works should be shown explicitly. In this investigation, analysis of two Scenarios, model sensitivity and the result of evapotranspiration based on the SEBS model are presented, but the main purpose of this paper is not described clearly in abstract. Moreover, the description of

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the ground data is incomplete and the cause of the bias is also insufficient explored. Based on above comments, I suggest accepting this ms for publishing in this journal after considering the above comments and correcting following comments.

Specific comments: 1. P1166L15-18, ‘Accurate quantification of the amount of evapotranspiration and its spatial distribution is important in research in fields of hydrology, agronomy and meteorology. This information aids in precision irrigation, determining crop water stress and water use of vulnerable ecosystems, and predicting weather and climate change.’ References needed to support your sentences. 2. P1166L25-26, ‘Conventional SVATs are based on point measurements and give only reliable results at the local scale. These models cannot be upscaled to larger areas because of the heterogeneity of land surfaces and the dynamic nature of heat transfer processes.’ I don’t think this is proper here. More and more works are based on the SVAT model with satellite remote sensing to upscale larger and heterogeneity areas. 3. The author should do explain the SEBS algorithm more detailed not just about the roughness length. 4. P1171L3, ‘After atmospheric correction’, the authors do not show how the atmospheric are corrected? 5. P1171L5-7, ‘Surface temperature and surface emissivity are retrieved from a temperature-emissivity separation (TES) algorithm (Gillespie et al., 1999) using all five atmospherically corrected TIR bands.’ The authors do not present how to estimate the surface temperature and emissivity based on TES algorithm. 6. P1173L13-16, ‘The output of the SEBS model consists of the spatial distribution of net radiation (Rn), soil heat flux (G0), sensible heat flux (H), latent heat flux (LE) and evaporative fraction (∧) at the moment of satellite overpass (18 July 2004, 11:00:29 UTC) (Fig. 2).’ The authors do not show how the heat fluxes are calculated. 7. P1177L6-7, ‘These parameters are empirically derived from their relationship with NDVI (Eqs. 1, 2 and 3) and are correlated.’ How do the authors correct these parameters? 8. A catering plot is more suitable to express the correlation between field observations and modeled surface parameters rather than Table 4.

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