

Interactive comment on “Remotely sensed latent heat fluxes for improving model predictions of soil moisture: a case study” by J. M. Schuurmans et al.

Anonymous Referee #1

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This is an interesting paper, which main contribution to me seems to be that satellite ET estimates can be used to diagnose model calibration or structural errors. As such the title is a bit of a misnomer.

Main comments:

1. Re the “improving” in the title. This paper focuses on validation and does not in fact improve the model used, rather points out (one?) source of error. Not a problem, but

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pls rephrase accordingly, also throughout the text.

2. Re “soil moisture” In the title. I found rather little discussion as to whether soil moisture estimates are indeed improved. I would certainly have liked to see that sort of analysis/discussion – can it be added?

3. I struggled to cross-reference the location acronyms to their characteristics and results. Can you use more insightful site references than ‘SZ’, ‘GD’ etc? E.g. with a brief reference to soil or land cover (whichever is most relevant for the interpretation)

4. The ET bias correction applied seems very large to me and suggests either of the two estimates is way of the mark. This needs a fair bit more discussion.

Specific comments/suggestions:

- Page 6179 / Line 2) “This paper investigates” – papers are inanimate, rephrase
- 4) delete “aim to”
- 6181 / 7) define “operational” and also “physically-based” (in latter case: as opposed to what?). Same in line 26.
- 24) gifts -> application
- 28) Better to introduce term “MetaSWAP” in methods?
- 6182 / 2) “a” specify – was it the same model?
- 11-18) could be removed I think
- 22-23) “on laps cover sand” ?? correct sentence pls.
- 6183 / 18-20) “Only..zone” Cryptic sentences, pls explain. Also Equation not Eq
- 6185 / 2) Pls specify bands used and source of ASTER and MODIS data (there are many MODIS data sets). Also pls comment on the method and sources of error/uncertainty, these are important for interpretation.

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- 3-4) Check figure numbers. Also, pls explain how ETpot was calculated.
- 6186 / 13) “both left and right side” what does this mean? Both measurements of the replicate? Rephrase.
- 6188 / 9) Introduce ETpot,s , what do subscript s and m stand for?
- 11) can -> may. Also, pls elaborate, not clear to me why this is the case.
- 16) 2.5-2.74 mm - that seems a pretty massive bias correction to me! Presumably with such a large difference you should be able to assess which is more credible? This definitely needs more discussion.
- 21) “estimate” not determine. Also, on what basis do you defend this approach?
- 9) 100 cm seems extraordinary shallow. Pls discuss – may be a source of model error?
- 14) There would seem to be some circularity in your approach; you use the same data for validation? Pls discuss.
- 6190 / 2) Note that assuming random error probably leads to a conservative (high) estimate of error; there is likely to be a structural component as well.
- 6191 / 10 (or thereabouts)) around here you should also be able to comment on the degree to which your soil moisture estimates improved compared to the site observations? (noting that the measurement scale discrepancy)
- 6192 / 5) That does not surprise me at all given the seemingly unrealistic rooting depth of 1 m for forest vegetation.
- 15-26) much too verbose and speculative. I don't think you need to invoke hydraulic lift to explain this, even though it may happen too. Deep water uptake can happen without any hydraulic lift!
- 6193 / 8-9) “The..model” It seems to me you have only discussed one structural error?

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Which other ones?

- 17) proof -> prove

- 18) “this appeared not enough . . .” You state this but did you try? Haven’t seen it..

- 6194 / 1-4) Good point. Would extend to “..model calibration or structural error”

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