A bare ground evaporation revision in the ECMWF land-surface scheme: evaluation of its impact using ground soil moisture and satellite microwave data

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Review

Summary:
The authors describe a new formulation that is implemented in the ECMWF land-surface scheme to improve soil moisture modelling under bare soil conditions. The modelling results of the old and new formulation are compared to in situ measurements of soil moisture in offline experiments that clearly show the improved soil moisture modelling. Data from the operational version of the land-surface scheme are also compared to in situ data to illustrate the improvement in the soil moisture modelling. To study the sensitivity of the Tb modelling with CMEM (which is important for SMOS data assimilation) to the soil moisture modelling improvement the TB modelling results of both versions of the land-surface scheme are compared. SMOS TB data are also compared to both Tb data products and show small improvements.

General remarks:
The manuscript is well structured and written clearly, mostly in very good English. It presents interesting and new results that should be of interest to readers of the journal. The figures and tables are of high quality and present interesting content. The reference list is appropriate.
I would propose to add a few points to the discussion in the manuscript and make minor revisions.

Major points:

- p. 6728, chapter 3.1.1: If you use your model to determine which stations are considered unreliable it is also possible that stations are sorted out because the model does not realistically model the soil moisture at a specific location. Maybe discuss a bit more that not only stations with disfunctional measurements or a non representative location are sorted out by this procedure but also stations that are located in an area where your model is not able to produce good results (e.g. because of wrong land surface or soil parameterisation).
- It would be interesting to see a comparison between SMOS data and the modelled TB. Maybe consider providing some figures in a next version of the manuscript.
- Please discuss a bit more the significance of the global comparisons with SMOS data. As the RFI problems in SMOS Tb data are considerable in certain regions of the world, e.g. in Central Europe, it would be even more interesting to do SMOS comparisons for different regions of the world and discuss the RFI impact on the data and the significance of the results individually for each region.

Minor points:
In few instances the language should be improved to ease understanding:

- P.6717, l. 15: forecast skill
- P. 6718, l. 9: with other modifications
- P. 6720, l. 29: until it saturates/ until it is saturated
- p. 6721, l. 28: There are continuous efforts...
- p. 6724, l. 19: ...to be computed as a function...
- p. 6725, l. 6/7: Please restructure this sentence. It is not easy to understand.
- P. 6729, l. 1: with a non significant correlation...
- P. 6729, l. 3: does not alter...
- P. 6731, l. 17: Positive differences
- P. 6732, l. ½: I do not understand this sentence. Please restructure.

P. 6720, l. 17: Please provide a short description of what H-TESSEL is. Is it a land surface model? On page 6722 TESSEL is mentioned. Here a short description would also ease understanding.
p. 6721, l. 27: Please provide a short description of what cycles are? Are these software versions?