

Interactive comment on “Comparing soil moisture retrievals from SMOS and ASCAT over France” by M. Parrens et al.

Anonymous Referee #2

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In the present study SMOS L2 soil moisture products and ASCAT soil moisture products are compared to soil moisture stations of the SMOSMANIA network in Southern France and to soil moisture fields of the ISBA model in the whole of France. In addition to that soil moisture products are generated from SMOS-L1 data by the use of regressed empirical logarithmic equations that make use of a combination of SMOS Tb at different incidence angles and different polarizations as well as the ISBA-LAI and surface temperature. Generally ASCAT provides better results than SMOS but under certain conditions (e.g. specific vegetation and wetness conditions) SMOS performs better. The soil moisture product derived from SMOS L1 data showed better correlations with the stations and the model than the SMOS L2 product. The triple collocation method was also used to determine relative errors in the SMOS-L2, ASCAT and ISBA

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soil moisture products. Topography was identified as one geographic factor influencing the performance of the soil moisture products.

The authors describe a very thorough and interesting analysis of two satellite soil moisture products over France in 2010 which should be of great interest to the readers of the journal. The authors state new findings that are very relevant. Especially the SMOS results are very interesting as there are not a lot of thorough studies delivering findings on SMOS data and they conclude that there is more potential in the data than what can be expected from the L2 data at the moment. The discussion of the impact of the sampling depth is interesting and important. It would be interesting to enhance that discussion with the use of different soil layer configurations of the model if they were available.

The paper is well structured and written clearly. The figures are informative and clear. The title clearly describes the contents of the paper. The abstract provides a concise and complete summary, the reference list is appropriate. It is recommended for publication after minor changes. I have a few comments:

- In some rare cases spelling mistakes should be corrected: p. 8568, line 24; p.8575, line 15; p.8580, line 10
- P. 8573, section 2.3: So, does the model include three soil layers for the soil moisture modelling (1 skin layer, one for the root zone and a deeper one)? Please clarify.
- P. 8574, line 1: What is the atmospheric forcing produced by SAFRAN? E.g. Interpolated station data? Please add a sentence to clarify.
- Please discuss the applicability of this approach to other regions (especially the derivation of soil moisture from SMOS Tb data by the use of regressed empirical logarithmic equations).