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Hydrology and Earth System Sciences
Discussions

Interactive comment on "SMOS near real time soil moisture product: processor overview and first validation results" *by* Nemesio Rodríguez-Fernández et al.

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We thank the referee for his/her interesting and constructing comments.

Regarding comment 1.

Unfortunately it seems that there is a misunderstanding. ECMWF SM is not used to train the NN. The NN is trained on SMOS L2 SM. We will clarify this in a new version of the manuscript explaining better the differences of the approach used to implement the NRT SM product with respect to Rodriguez-Fernandez et al. (2015). Regarding the more general comment on the sensing depth, it is well-known problem to validate

remote sensing data using ground measurements. Unfortunately, this effect cannot easily be disentangle of the spatial representativity effect, that is, that remote sensing measurements are representative of 40-50 km while the in situ measurements are point-like measurements. This spatial representativeness can easily be a more significant effect than the sensing depth issue. In a new version of the manuscript we will add a discussion on both the sensing depth and the spatial representativeness issue. That said, the goal of this paper, as stated in the title, is to present the algorithmics and "first validation results". Follow up more thoughtful validation studies will be recommended, ideally from independent teams of potential users of this new ESA operational product.

Regarding comment 2

First, as said above, the SMOS NRT SM does not use ECWMF 0-7 cm soil moisture. Second, the goal of this study is not to modify the way the SMOS L2 SM algorithm deals with soil temperature, but to find a statistical alternative providing results faster at at least of the same accuracy, and we showed that the accuracy of the NRT is slightly increased with respect in situ measurements. In this context, we are afraid that a discussion of the effect of soil temperature in the Tor Vergata model (Dente et al.), would be out of the scope of this manuscript. As the referee reminds, the SMOS L2 SM uses the approach of Wigneron et al. to compute a soil effective temperature, and the temperature data used in the SMOS L2 SM algorithm comes from ECMWF model simulations. Therefore, it is logical to use ECMWF 0-7 cm temperature as a predictor in the input of a neural network trained on SMOS L2 SM. The evaluations after training, show that adding this soil temperature to complement the SMOS brightness temperatures improve the NN performances to capture the dynamics in the training data by $\sim$ 3 %. In a corrected version of the manuscript we will clarify this point taking into account the referee comment.

Typos

Thank you for pointing out those typos and misspellings. They will be corrected.

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