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Interactive comment on “Estimating root zone soil moisture using near-surface observations from SMOS” by T. W. Ford et al.

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General Comments

With pleasure I have quickly read this paper, which is well written, well structured and clear. It addresses an important topic that I found to be very interesting as in hydrological application we strictly need a root-zone soil moisture product. I have posted this comment for two main reasons.

1) The study confirms the reliability of the exponential filter proposed by Wagner *et al.* (1999), notwithstanding its simplicity. Moreover, the dependence of this method from the T parameter is found to be not significant and the use of a constant T-value

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can be considered for applications at a global scale. In previous studies, we obtained the same findings by comparing ASCAT soil moisture data with in situ observations in several sites across Europe (Brocca *et al.*, 2010, 2011, 2013). In fact, by using a constant T-value, the agreement between the SWI and in situ observations does not change significantly.

2) Reading the title of the paper, I expected a more deep analysis of the SMOS product for obtaining a root-zone soil moisture estimate. However, only one section (section 4) is given to this aspect while the major part of the paper analyzes the in situ observations. The SMOS results are only reported in one figure (Figure 14). The analysis is only carried out for Oklahoma network and not for Nebraska. Why? The results are only shown in terms of mean bias error and Nash-Sutcliffe. Why are the other performance scores not used? In the conclusion it reads "The exponential filter method ..., as assessed by the NS score, performed well at 21 of the 23 sites." But no details are given for that. I suggest extending the analysis with SMOS data that represents the major novelty of the proposed study.

Moreover, a root-zone soil moisture product, called CATDS Level 4 SMOS Drought Index, is delivered as high-level soil moisture product for SMOS (<http://www.cesbio.ups-tlse.fr/us/indexsmos.html>). It would be highly interesting (at least for me) to make a comparison between the method proposed by the authors and this product.

Finally, one minor comment: in Table 1 the revisit time of ERS 1-2 SCAT and MetOp ASCAT is daily. The temporal resolution reported in the table is probably referred to the SAR sensors, not the scatterometer.

Reference

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