

Interactive comment on “Matching ERS scatterometer based soil moisture patterns with simulations of a conceptual dual layer hydrologic model over Austria” by J. Parajka et al.

J. Parajka et al.

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We would like to thank the anonymous reviewer for her/his helpful comments on the manuscript. The major comments have been addressed in a response submitted earlier. The minor remarks are addressed as follows (listed in the sequence given by the referee):

- 1) We reread the paper and corrected several grammatical/spelling errors or incomplete sentences. We are happy to make additional changes if more specifics are provided.
- 2) We agree with the reviewer. In response to this comment we have rephrased the

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sentence and corrected the references to the existing studies as follows: "Soil moisture assimilation has attracted a lot of attention in hydrology in the last decade (e.g. Hoeben and Troch, 2000; Houser et al., 2000; Walker et al., 2001; Francois et al., 2003, Parada and Liang, 2004 and 2008, Reichle and Koster, 2005, Crow et al. 2005). These studies ... "

3) In response to this comment, we have modified and extended the introduction section as follows: "Pauwels et al. (2002) assimilated scatterometer soil moisture into a lumped hydrologic model and investigated the potential of improving runoff predictions. Another important application is ..."

4) The main objectives of the paper are related to the soil moisture, thus we prefer not to extend the model description. The detailed description of the model (including snow sub-module) is presented in previous papers. As it is already stated in the manuscript (p.3322, l8-9): "A detailed information about the remaining part of the hydrological model is given in the appendix of Parajka et al. (2007)."

5) In response to this comment, we have corrected the typo in Eq. 5. We believe that the performance mean difference measure SB is an adequate alternative to the RMSE, as it also indicates tendencies, where and when the model tends to over/underestimate the scatterometer observations.

6) The nonlinear relationship of soil moisture with backscatter is actually introduced by some theoretical models of backscattering from bare soil whereas, in practice, the backscattering mechanism is more complex especially due to the interaction of the microwaves with the vegetation and soil. Nevertheless, none of the validation studies so far has demonstrated that suspected non-linearity is of real concern (e.g. Ulaby, et al. 1982, Dobson, et al. 1992, Srivastava, et al. 1997, Oldak, et al. 2003, Ceballos, et al. 2005, Thoma, et al. 2006). We believe that this investigation is beyond the scope of this study and with respect to this comment we prefer to retain the manuscript as it is.

7) In response to this comment we have rephrased the sentence as follows: "Surface

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soil moisture tends to vary considerably in time. "

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