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Biogeosciences Discussions

Interactive comment on "Assimilation of Soil Wetness Index and Leaf Area Index into the ISBA-A-gs land surface model: grassland case study" *by* A. L. Barbu et al.

Anonymous Referee #2

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The paper is very interesting as it demonstrates the benefit of jointly assimilating a soil moisture product and LAI into an LSM. I don't have many comments. Some minor remarks are:

The paper seems to suggest (cfr. first sentence in the conclusion) that it is the first in its kind in which both variables are assimilated. However, Pauwles et al. (2007) did something very similar. I suggest to the authors to reference to this paper and maybe validate whether similar conclusions can be drawn.

It is not really clear to me why the authors chose for the Extended Kalman Filter. This type of filter is not used very much. In literature, one finds more references to the

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Ensemble Kalman Filter. Can the authors argument why they chose for this filter (and furthermore why a simplified version)?

The paper mentions that there are quite often biases to be seen between observations and model results. However, the filtering algorithm doesn't take a bias correction into account. I suggest that the authors would better comment on this issue and refer to literature in which it is tried to address this problem (De Lannoy did some interesting things on this issue).

De Lannoy G.J.M., Reichle R.H., Houser P.R., Pauwels V.R.N., Verhoest N.E.C., Correcting for forecast bias in soil moisture assimilation with the ensemble Kalman filter, Water Resources Research, 43, W09410, doi:10.1029/2006WR005449, 2007.

De Lannoy G.J.M., Houser P.R., Pauwels V.R.N., Verhoest N.E.C., State and bias estimation for soil moisture profiles by an ensemble Kalman filter, Water Resources Research, 43(6), W06401, doi:10.1029/2006WR005100, 2007.

Pauwels, V. R. N., N. E. C. Verhoest, G. J. M. De Lannoy, V. Guissard, C. Lucau, and P. Defourny, Optimization of a coupled hydrology–crop growth model through the assimilation of observed soil moisture and leaf area index values using an ensemble Kalman filter, Water Resour. Res., 43, W04421, doi:10.1029/2006WR004942, 2007.

Interactive comment on Biogeosciences Discuss., 8, 1831, 2011.