

Interactive comment on “A dynamic approach for evaluating coarse scale satellite soil moisture products” by A. Loew and F. Schlenz

Anonymous Referee #2

Received and published: 11 November 2010

The title/abstract of the paper suggests that a novel evaluation approach for coarse resolution soil moisture data is presented. In fact the paper presents an analysis of the triple collocation (TC) error model which was first published in the 1990s. The only novel aspect of the study is the application to temporal subsets of the analysed data to account for temporal varying biases.

The paper is still worth publishing as it provides some interesting insight into the temporal and spatial sampling characteristics and representativeness of different soil moisture products. In addition the analysis confirms the robustness of TC when applied with in-situ data. TC can account for scaling errors, which could be an interesting prospect of the method.

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Following issues need to be clarified:

1. A relatively small set of data is used in the analysis, specifically when applying TC in a temporal adaptive way. The question arises if the observed differences in the observed gain parameters and errors are significant. This could easily be tested.
2. The low number of observations could also result in biased error estimates as the sample size might not allow deriving a stable pdf. Consequently the conclusion that the observed lower errors for the adaptive approach (compared to the static one) are due to higher accuracy of the satellite product during different periods may not be fully true. The lower errors can also be an artefact caused by the limited sample size.
3. The authors removed satellite observations that were affected by precipitation. To address the study objectives this is a valid approach. The authors should however be careful in providing error figures for the satellite product as they are idealized error estimates which may not be representative in practice.
4. Use SI units throughout the manuscript.
5. In Eq 7 I assume the alpha terms should be dismissed. As alpha is a constant it should be 0 after removing the mean.
6. p 7276 line 23: The authors state that TC relies on a significant correlation. This is not entirely true. TC presumes that the three data sets used in the analysis observe the same geophysical quantity. This can be tested with the correlation analysis. It could however be that the correlation is low, for example if the SNR is low under constant dry conditions, and that TC would still provide correct error estimates.
7. section 5.2.1 only provide significant digits for the error figures.
8. Table 3: the subscripts are confusing. In the capture sat, model sat is used. In the table station, stat, model, sat and for the correlations x, y and z. Use the same notation and explain it in the text.

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9. Fig 2: It would be informative to plot the soil moisture evolution for each station to better see the spread/differences.

10. Fig 4: replace x, y, z with model, station and sat. (same for other figures)

Interactive comment on Hydrol. Earth Syst. Sci. Discuss., 7, 7263, 2010.