

Interactive comment on “Analysis of surface soil moisture patterns in agricultural landscapes using empirical orthogonal functions” by W. Korres et al.

Anonymous Referee #3

Received and published: 24 November 2009

General Comments

This paper investigates soil moisture patterns using EOF analysis to measurements and the dominant factors using correlation analysis between soil moisture patterns and other parameters. This is an important issue for agriculture, hydrology, meteorology and many other scientific disciplines. The background, methods, and results are clearly presented. My major concern is the limitations in the soil moisture data for the EOF analysis. I would like to suggest more justifications or explanations for the research methodology provided before considering acceptance for publication.

Specific Comments

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Major

1. The soil moisture data used are for the top 6 cm soil layer. Physically, this layer mainly responds to daily atmospheric processes. How much meaningful is it to use this data to analyze soil moisture connections at monthly and longer scales?
2. Moisture measurements of top soil layer at one day during a month or longer period does not reflect much about soil moisture condition for the period; Instead, it could be easily affected by rainfall on and/or shortly before the measuring day. Thus, evidence is needed to indicate that the measured patterns of a specific date is not a random ones.
3. The soil moisture differences from the average over times at a location do not remove seasonal cycle, which can be seen in the original measurements though it looks weaker than that in many other geographic areas. As a result, the time coefficient series for major EOF patterns for both sites mainly reflects this temporal variability.
4. As little as 8 samplings in time domain is used. This number is considered to be too small for a temporal correction calculation in the EOF analysis.

Minor

1. Line 12, P. 5569: please spell out SFB/TR32.
2. Line 18, P. 5570: spell out or explain ENVISAT.
3. Line 3, P. 5572: EOF was already defined earlier.
4. Line 23, P. 5570: superscript?

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5. Line 12, P. 5573: extra comma?
6. Line 4, P. 5575: please explain “not overlapping with another”.
7. Line 12 and Line 14, P. 5578: please describe more about how to obtain EOFs calculated for analyzing spatial patterns and temporal patterns.

Interactive comment on Hydrol. Earth Syst. Sci. Discuss., 6, 5565, 2009.

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