



Soil moisture spatial variability: inter- and intra-annual dynamics

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Field experiments have shown that soil moisture exhibits considerable spatial variability. Non-stationary conditions in forcing (precipitation, potential evaporation) and vegetation characteristics (e.g. leaf area index) can cause this variability to change in time. In previous work, Teuling et al. (doi:10.1029/2004GL021935) have shown that the strength of the seasonality in these conditions can be used to explain different observed trends between the spatial mean soil moisture content and its variability. Interannual fluctuations in forcing may lead to different relations between the mean soil moisture content and its standard deviation. Here we investigate the interannual differences in this relation for a maize field in Louvain-la-Neuve (Belgium), using ensemble runs (representing spatial variability) of a simple soil moisture model forced with meteorological observations for the years 1989–2003. Comparison with soil moisture observations at the field scale (1999) and the row scale (2003) suggest that interannual fluctuations in forcing indeed have a large impact on the dynamics of soil moisture variability.