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# Soil moisture memory in a regional climate model for the Indian summer monsoon season

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Soil moisture is a slowly varying land surface component, and it could adversely affect the near surface atmospheric variables through a feedback loop with land-surface evapotranspiration. It has persistence property and can remember previous atmospheric forcing event which can translate in the following week or season. Here, soil moisture memory was quantified with the non-hydrostatic regional climate model COSMO-CLM over the Indian sub-continent. The simulation was driven by lateral boundary condition derived from the coupled global ocean-atmosphere model ECHAM5/MPIOM under pre-industrial greenhouse gas concentrations while the memory analyses were done for the Indian summer moonsoon season (ISM). Our analysis reveals that the memory in the root zone layers, especially over the arid western region of India, is within the sub-monsoonal scale range, and thus accurate initialization of the root zone soil moisture is essential for a reliable simulation and seasonal forecasting of the ISM.