

MULTI-SCALE MODELING AND BIG-DATA ANALYSIS OPPORTUNITIES IN VADOSE ZONE HYDROLOGY

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Modeling of the vadose (or unsaturated) zone of the earth's surface requires multi-scale, multi-physics computation, often along with manipulation of large datasets. In this talk, we present some opportunities for collaboration between hydrologists and computational scientists in the area of soil water dynamics and agro-meteorology. Some recent work and critical challenges regarding understanding and modeling of subsurface flow patterns; physical controls of soil moisture variability across spatial scales; analysis of data from large, spatially-distributed sensor networks; prediction of crop growth and real-time disease potential; and calibration/validation of multi-resolution, multi-platform co-located datasets for multi-scale modeling, among others, will be presented.