



Estimation of soil moisture at the regional and global scale using field experiments, remote sensing and land surface modelling

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This session focuses on soil moisture estimation including remote sensing, field experiment and land surface modeling. Microwave remote sensing as proved its high potential to retrieve surface soil moisture at different scales. From local to landscape scales several field or aircraft experiments, PORTOS-91/93/96, SGP97/99, EUROSTARRS 2001, SMEX-02-04, SMOSREX and coSMOS-2005 are dedicated to improve our understanding of the active and passive microwave soil moisture sensing including the effects of soil roughness, vegetation spatial heterogeneities, topography. At continental scales several space sensor SMMR (1978-1987), AMSR(2002-) in passive microwave as well as ERS/SCAT (1992-2000) already provide information on surface soil moisture. Further investigations in passive microwave at L-band with SMOS (2007) and HYDROS (2009), and in active microwave with Metop/Ascatter (2005) open new possibilities in the quantification of the soil moisture from regional to global scales. The comparison between soil moisture simulated by land surface models and remotely sensed soil moisture is also relevant to characterize the continental scale soil moisture dynamic (GSWP2). Presentations concern: (i) soil moisture remote sensing, including field experiment and theoretical advances in soil physics and remote-sensing soil physics in microwave radiometry, (ii) root zone soil moisture retrieval and soil moisture assimilation in land surface models, (iii) up-scaling and heterogeneities considerations for continental scale approaches, (iv) inter-comparison and inter-validation between land surface models and remote sensing approaches.