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The AMMA Land Surface Model Intercomparison Experiment coupled to the Community Microwave Emission Model: ALMIP-MEM

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This paper presents the African Monsoon Multidisciplinary Analysis (AMMA) Land Surface Models Intercomparison Project (ALMIP) for Microwave Emission Models (ALMIP-MEM). ALMIP-MEM consists in an ensemble of simulations of C-band brightness temperatures over West Africa for 2006. Simulations have been performed for an incidence angle of 55 degrees and results are evaluated against C-band satellite data from the Advanced Microwave Scanning Radiometer on Earth Observing System (AMSR-E). The ensemble encompasses 96 simulations, for 8 Land Surface Models (LSMs) coupled to 12 configurations of the Community Microwave Emission Model (CMEM). CMEM has a modular structure which permits combination of several parameterizations with different vegetation opacity and soil dielectric models. ALMIP-MEM provides the first inter-comparison of state-of-the-art land surface and microwave emission models at regional scale. Quantitative estimates of the relative importance of Land Surface Modeling and radiative transfer modeling for the monitoring of low frequency passive microwave emission on land surfaces are obtained. This is of high interest for the various users of coupled land surface microwave emission models and for the SMOS Validation and Retrieval Team (SVRT). Results show that both LSMs and microwave model components strongly influence the simulated Top Of Atmosphere (TOA) brightness temperatures.