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Quantification of uncertainties in global coarse-resolution soil moisture products using in-situ observations and ASAR

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We present some recent findings in quantification of the uncertainties in global coarse-resolution soil moisture products using in-situ observations and high resolution ASAR retrievals. Two permanent regional in-situ soil moisture and soil temperature observation networks were setup for the purpose of validation and calibration of satellite soil moisture observations on the Tibetan plateau in Naqu in 2006 and in Maqu in 2008. The in-situ soil moisture measurements are used to validate soil moisture retrievals from a time series of 150 ASAR Wide Swath (WS) mode observations. Based on the validated ASAR products from 2005-2008 a method is proposed for quantifying uncertainties in soil moisture observed at a coarse-resolution and simulated using the MM5-Noah regional climate model. The major issues to be presented are:

1. Global products are useful but uncertain – use of them would be critically enhanced if uncertainties can be quantified;
2. A methodology for upscaling of soil moisture is possible by using in-situ observations and high resolutions ASAR products;
3. Process level understanding is critical for generation of global products to be useful for climate change studies;
4. Soil moisture can be used as important indicator quantifying the dynamics of water cycle in a changing climate.