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Assimilation of global ASCAT soil moisture observations in the ECMWF Numerical Weather Prediction Model

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The European Centre for Medium-Range Weather Forecasts (ECMWF) currently prepares for the assimilation of soil moisture data derived from advanced scatterometer (ASCAT) measurements and from the Soil Moisture and Ocean Salinity Mission (SMOS).

Here we will report on first results from the assimilation of ASCAT data into the Integrated Forecasting System of the ECMWF. ASCAT is part of the MetOp satellite payload launched in November 2006. In December 2008 the ASCAT soil moisture service was declared operational by EUMETSAT. This service will ensure the operational provision of soil moisture information until at least 2020. As the scatterometer data is derived using a change detection method we will present a transfer function which (i) minimises systematic differences between the model and observations and (ii) convert the relative soil moisture values as obtained by the scatterometers into model equivalent volumetric soil moisture. We will show assimilation results using an Extended Kalman Filter which will be the operational assimilation scheme for soil moisture at the ECMWF in near future. Specifically, we will analyse the potential of surface soil moisture observations, as will be delivered by ASCAT and SMOS, to constrain a multi layer land surface scheme, and the impact of their assimilation on numerical weather prediction.