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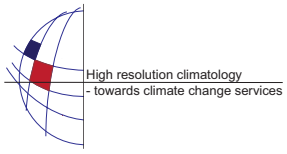

ASCAT soil moisture data assimilation in the local area model ALADIN

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Soil moisture is crucial for all biological life on land and controls the energy, water and carbon fluxes at the land surface, thus influencing the weather. Therefore, knowledge about the soil moisture distribution is of large interest for weather forecasting, flood and drought monitoring, and civil protection. Investigations are showing that the spatial and temporal distribution of soil moisture in mid-latitudes has important implications especially for the summertime convective precipitation distribution. In general, higher levels of soil moisture and evapotranspiration lead to higher levels of precipitation due to feedback mechanisms.
To determine the soil moisture distribution, the field of microwave remote sensing has been an important research topic since the 1970s, but only in the last few years significant progress towards operational soil moisture services has been made. This progress became possible due to advances in sensor technology and new algorithmic approaches. The first near-real-time (broadcasting within 130 minutes after sensing) soil moisture service was started by EUMETSAT in May 2008 based on METOP ASCAT scatterometer, providing soil moisture data on a 25km grid over Europe with a temporal coverage of about 1.5 days.
While there are already several investigations about assimilation of these data to global forecast models resulting in small improvements of screen level parameters, ASCAT soil moisture assimilation in local area model (LAM) is a new scientific topic. For this purpose, the high resolution measurements are assimilated at the Austrian federal weather service ZAMG into its version of the local area model ALADIN. The main goal is the further improvement of the forecast quality, especially in convective situations, taking into account the complex topography in Austria. Data assimilation is executed with an extended Kalman filter (EKF) approach developed at Météo France and CNRM within the surface modelling system SURFEX.
The presentation of results from several test runs will highlight advantages and problems of this new system, both for scientific research and operational weather forecasting.