Geophysical Research Abstracts
Vol. 13, EGU2011-10948, 2011
EGU General Assembly 2011

Introducing a sea ice scheme in the mesoscale NWP model COSMO-EU of the German Weather Service

Jan-Peter Schulz
Deutscher Wetterdienst, Offenbach a.M., Germany (jan-peter.schulz@dwd.de)

The presence of sea ice on the ocean's surface has a significant impact on the air-sea interactions. Compared to an open water surface the sea ice completely changes the surface characteristics in terms of albedo and roughness, and therefore substantially changes the surface radiative balance and the turbulent exchange of momentum, heat and moisture between air and sea. In order to deal with these processes the operational global model GME at the German Weather Service (DWD) includes a sea ice scheme. This scheme was now also implemented in DWD's limited area model COSMO-EU, covering almost all Europe using a mesh size of 7 km. The sea ice scheme accounts for thermodynamic processes, while no ice rheology is considered. It basically computes the energy balance at the ice's surface, using one layer of sea ice. From this the evolution of the ice surface temperature and the ice thickness are deduced. This allows for a better thermodynamically coupled treatment of sea ice in the COSMO model as lower boundary condition for the atmosphere. This means, the scheme allows for a diurnal cycle of sea ice surface temperature which was not present in the COSMO model before. As input the scheme needs the sea ice distribution which is provided by the operational analysis of sea surface temperature (SST). Results of a continuous numerical experiment during the sea ice season in the Baltic Sea in early 2010 are presented. Improvements are found in particular in the 2-m temperature and the humidity.