Geophysical Research Abstracts,
Vol. 10, EGU2008-A-07985, 2008
SRef-ID: 1607-7962/gra/EGU2008-A-07985
EGU General Assembly 2008

Uncertainty problems in NWP forecasts based on nested grid approach

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For successful simulations of severe weather phenomena, a mesoscale model must be able to incorporate the large-scale weather variations. In our numerical weather prediction system running operationally more than two years, the concept of nested grid formulation is used. The model we implemented is a parallel version of the US Navy COAMPS model. In recent set-up of the model we are using three nested grids. The coarser computational grid has a 39 km spatial grid step and covers North Atlantic and Europe area. The finest one, spanned over Poland, has 4 km resolution. For each grids of increased resolution the data assimilation using multidimensional optimal interpolation is performed. We would like to present a comparison of selected meteorological variables in different meteorological situations for observations and few COAMPS runs. The focus will be on precipitation patterns for different model resolution. The accurate simulation of clouds and precipitation is important for number of applications - here we list only distributed hydrological models used in flash flood forecasting and air quality models because cloud and rain droplets are efficient diluters for many pollutants. In our presentation we will try to estimate the uncertainty of precipitation forecasts simulated for different resolution and show the usefulness of the nested grid approach for detailed prediction of precipitation events.