



ICON – Towards operational numerical weather prediction

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The ICON (ICOsahedral Nonhydrostatic) model is being developed jointly at the German Weather Service (DWD) and the Max-Planck-Institute for Meteorology (MPI-M) since 2004, in order to achieve a unified modelling framework for global numerical weather prediction and climate modelling. It is based on an icosahedral grid, like DWD's current global model GME, but uses a triangular C-grid rather than a hexagonal A-grid for horizontal discretization. Beyond that, it allows for static mesh refinement. Particular care has been taken to achieve global mass conservation, tracer-air mass consistency and scalability on massively parallel computing architectures. ICON is planned to replace the GME in the operational forecasting suite of DWD by the end of 2014, using a horizontal resolution of about 13 km, and 90 vertical levels up to 75 km height.

Currently, the main focus in the NWP context is on coupling ICON with the 3D-Var data assimilation scheme taken over from the GME forecasting system. While the 3D-Var scheme remained largely unchanged, the ICON- and GME forecasting systems differ in terms of how analyses are incorporated into a model integration. While GME uses the traditional Incremental Digital Filtering (IDF) approach, ICON uses the Incremental Analysis Update (IAU) technique to filter high-frequency noise (i.e. spurious gravity waves).

In the presentation, an overview of the current status of development will be given, focusing on the current forecast quality in NWP applications, our first experiences with IAU, and on the computational performance of ICON on massively parallel architectures.