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Extraordinary Seminar

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Multi-node OpenACC Implementation of the ICON Non-hydrostatic Dynamics Core

Monday, January 27, 2014 13:00
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We have ported the Icosahedral Non-hydrostatic (ICON) model's dynamics solver to Graphical Processing Units (GPUs), which is a task within the Partnership for Advanced Computing in Europe (PRACE), Second Implementation Phase (2IP), Work Package 8 (WP8).

We will present the results of the multi-node OpenACC implementation of the ICON NHDC for GPUs. The code baseline is the ICON "DSL" (Domain Specific Language) testbed code, which is essentially a stripped-down version of the ICON model for dynamics simulations only. We will discuss on the OpenACC directives used for the port of the computational as well as the communication code to GPUs, and report the resulting GPU performance on NVIDIA K20x as compared to contemporary CPU architectures.

We are now undertaking the final step of incorporating the OpenACC directives into the ICON development trunk, based on the feedback given to us from the ICON developers at the Max Planck Institute for Meteorology (MPI-M) and the German Weather Service (DWD). We will report on the status of this integration effort and discuss the remaining steps foreseen in PRACE 2IP WP8.