Séminaire Mercredi 7 Mai 11h00 / Seminar Wednesday May 7, 11:00 AM

Conférencier/Lecturer: Felix Schueller

Sujet/Subject: Grid computing with - and standard test cases for - a meteorological limited area model

Présentation/Presentation: Anglais / English

Lieu/Room: Grande salle du premier étage CMC

Résumé / Abstract:

This talk concentrates on two aspects of numerical, meteorological limited area models. One is their implementation and testing on a very recent computing platform, the Grid. The second evaluates the adequacy of the numerical formulation of different parts of the model.

Grid computing is a relatively new method in High Performance Computing, interlacing different organizations to reach the common goal of an efficient computing environment. For research purposes Grids provide a great opportunity. The project MeteoAG establishes a workflow that can be executed in Grid environments. It produces a high resolution reanalysis precipitation database through re-simulating past heavy precipitation cases in the Austrian Arlberg region. The simulations are distributed automatically over the Grid and are executed on available supercomputers. As Grids are a heterogeneous computing environment, tests need to assure that model results are independent of the system they have been computed on. Using the Regional Atmospheric Modeling System (RAMS), developed at Colorado State University, with an idealized mountain flow simulation reveals differences up to 15-20 percent in the pressure perturbation of a linear hydrostatic mountain test case. This is only dependent on the utilized computing system as the input and setup is kept exactly the same.

In the second part, a set of seven test cases is used to check different areas of the numerical representation of an atmospheric model. These tests investigate the model through flow over topography in various setups or for example a density current flow, a

nighttime stratocumulus topped boundary layer and a warm moist convection case. The tests are implemented according to basic principles as easy evaluation, easy configuration and a comprehensive range of tested model aspects. Each case includes a proposed reference solution, and is applied to the limited area model RAMS.