

An Introduction to the **PAR**allelized **LES** Model **PALM**

Seminar to be held at the Research Institute of Applied Mechanics (RIAM), Kyushu University, Fukuoka, Japan, from March, 9th until March, 13th, 2009

PALM is a parallelized large-eddy simulation model, which has been continuously developed at the department of meteorology and climatology, Leibniz Universität Hannover, Germany, since 1997. It is used to study micro- and mesoscale turbulent boundary layer flows in the atmosphere and ocean by different groups of researchers all over the world. Compared with many other LES models, PALM includes a number of advanced features like topography, non-cyclic horizontal boundary conditions, an embedded Lagrangian particle model, or an interface for adding user-defined code. The ocean option of PALM includes salinity and the equation of state for seawater. A coupling between PALM-atmosphere and PALM-ocean has recently been developed. Data output is in NetCDF format. PALM is optimized for high performance on all kind of state-of-the-art processor architectures and scales up to several thousands of processors. It is free to use for research and can be downloaded from the internet. Download information and a detailed online documentation is available under http://www.muk.uni-hannover.de/~raasch/PALM_group.

Seminar contents

The one week seminar gives an overview of PALM, explains the installation procedure, and demonstrates how to carry out runs, either on Linux notebooks provided by the participants or on the NEC-SX8 parallel computer at RIAM. The seminar starts with a general introduction to large eddy simulation. Then the basic set of equations used in PALM are discussed and the numerical methods to solve them are described. After explaining the PALM installation procedure, the main focus is given on how to set up PALM jobs and how to run them using the ksh-shell scripts that are provided with PALM. Further attention is also given to questions like how to extend PALM by user-defined code and how to debug the code. Setups for several standard applications will be explained in detail (e.g. convection, flow around buildings, etc.). Beside the theoretical lessons given in the morning, there will also be hands-on sessions in the afternoon, where participants carry out exercises under the guidance of the lecturers.

Requirements

Participants should have a solid background in CFD modelling, FORTRAN90, MPI, and Linux/Unix. Participants are strongly encouraged to carry out the PALM installation and the exercises on their own Linux notebooks during the seminar. Notebooks should have at least a dual-core processor. Required software on the notebook are a FORTRAN90 compiler, an MPI library, the NetCDF library (not later than version 3.6.3), graphics software to display NetCDF data, the Korn-shell (ksh), as well as subversion (a revision control system necessary to download the PALM code). subversion is already a part of many Linux distributions (e.g. openSuSe).

The lecturers will be Siegfried Raasch, Marcus Letzel, and Gerald Steinfeld from the Institute of Meteorology and Climatology, Leibniz Universität Hannover, Germany.

Registration

Participation at the PALM seminar is free but requires registration until Friday 20 February, 2009. Please register by sending an email to raasch@muk.uni-hannover.de stating

- your name, affiliation and background
- the purpose of using PALM / visiting this seminar
- whether you will bring your own linux notebook or wish to use the NEC-SX9 parallel computer at RIAM during the seminar

Accommodation

Accommodation is not provided. You are kindly requested to organize accommodation by yourself.

For further information and questions please contact Siegfried Raasch under raasch@muk.uni-hannover.de .