

# Parallel ModelicaSpec High Performance Benchmark Suite

Contact: Peter Fritzson (petfr@ida.liu.se, tel: 0708-281484)

or Per Östlund (peros@ida.liu.se)

PELAB – Programming Environment Lab, Institutionen för Datavetenskap

[www.openmodelica.org](http://www.openmodelica.org)

At PELAB, together with the Open Source Modelica Consortium (an international open source effort supported by 28 organizations, see [www.openmodelica.org](http://www.openmodelica.org)) the OpenModelica environment including the OpenModelica Compiler (OMC) of the Modelica language including MetaModelica extensions is developed. The development is open source under the OSMC-PL and GNU V3 licenses.

Currently OMC compiles Modelica/MetaModelica into C-code via several optimizing steps. The development is supported by an Eclipse plug-in MDT (Modelica Development Tooling), also including a debugger, and a template language already used for developing code generators to C and C#. There has earlier been developed several parallel code generator prototypes from OpenModelica generating CUDA code for Nvidia.

The goal of this master thesis project is to put together a benchmark suite, tentatively called ModelicaSpec (inspired by the well-known Spec benchmarks) of Modelica applications (we have already several candidate programs), and perform systematic benchmarking of this on both multi-core and single-core platforms, also including the new 2-teraflop Nvidia 2050 GPU at PELAB:

The master thesis project requires some knowledge of compiler construction, parallel programming, as well as some experience and interest in advanced programming.

Below some measurements from November 2009, on older Nvidia GPUs as well as a standard Intel single core.



