Project: 948 Project title: PalMod_WG1M — Transient simulations of the last glacial cycle with the coupled atmosphere-ocean-ice sheet model MPI-ESM—PISM

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The project start of PalMod was delayed until September 2015, and only announced in August. Therefore only one postdoc (Florian Ziemen) started so far. Further group members will start in November (Petra Nerge) and January (Marie Kapsch).

We set up the ice sheet model PISM on Mistral, implemented first changes to adapt it for coupled ice sheet — climate simulations and performed first scaling tests. The model scales well (we tested it up to 64 nodes, and achieved a speedup by a factor of 1.87 over 32 nodes) and with the help of DKRZ we were able to make use of the parallel file I/O. This provided a massive speed-up of the model I/O and allows for high resolution experiments. As of 2015-10-22, 359 node hours were used.

With the possibility to do high-resolution simulations, we are able to resolve the narrow outlets that drain much of the ice from the ice sheets (Figs. 1 and 2). This is a good starting point for working on parametrizations and coupling in 2017.



Figure 1: Ice thickness in a CMIP5 forced northern hemisphere 10 km LGM test run.



Figure 2:

Ice speed in the same simulation as Fig. 1. Dark blue indicates fast flowing regions of the ice sheet. The ice streams draining the big ice sheets through sometimes narrow topographic troughs can be seen in dark blue.