



Influence of small-scale atmospheric processes on the decadal variability and predictability of the atmosphere-ocean-ice sheet system in the polar regions.

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The climate of the polar regions has dramatically changed over the last decades. This may have resulted from external forcing (e.g. from greenhouse gas emissions), but also from natural interactions between the components of the climate system (notably the atmosphere, the marine and continental cryosphere, and the ocean). Quantifying the specific contribution of each component is critical to understand decadal variability in the polar regions. Based on the complementary scientific expertise of its project partners, the PARAMOUR project aims at revealing the fundamental drivers of climate variability and assessing the predictability in the polar regions by developing and running a coupled atmosphere-ocean-ice sheet regional climate model over both hemispheres. Also, a smaller scale model setup will be developed for the Totten glacier region in Antarctica, as the Totten glacier is a highly dynamic glacier that, in recent years, has been strongly influenced by the sub-shelf intrusion of warm ocean currents. The models / components used will be the atmospheric model COSMO-CLM, the land surface model Community Land Mode, the ocean-ice model NEMO and the ice sheet models BISICLES and f.ETISH.

The purpose of this poster presentation is to present the PARAMOUR project to the geo-science community. Our focus in the PARAMOUR project is on atmospheric feedback processes such as those between clouds and radiation and those between surface albedo and atmospheric processes (for example the darkening of the surface due to scouring by wind). During the course of the project we plan to i) develop a coupled atmosphere-ocean-sea ice-ice sheet model configuration for the northern hemisphere, southern hemisphere and Totten glacier region, ii) analyze the interactions between the atmosphere, ocean, sea ice and ice shelves at scales between a few hundreds of meters and a few kilometers and iii) investigate how these interactions influence the variability and predictability of the system, both in the past and in the future.