

Projekt: 509

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Projekttitel: **Global atmosphere-ocean modeling of Holocene climate**

Asymmetries between the Earth's hemispheres in the land-ocean geography lead to asymmetries in climate variability and climate changes. Perhaps most notable are the out-of-phase or seesaw-like differences between ice core climate records from Greenland and Antarctica during both the present interglacial (the Holocene) and the last glacial. This project, proposed by researchers at the Centre for Ice and Climate (CIC), aims to study the relative roles of the ocean and atmosphere, low and high latitudes and forced and unforced variability in producing this structure in the climate records throughout the Holocene. By comparing the observed values of isotopes from Greenland's Icecores the functionality of the implemented module to model these isotopes data will be tested and a comparison between two different GCMs and a RCM will done. As part of the CIC's focus on measuring CO₂ in Greenland ice cores, biogeochemical ocean modeling will be used to determine the interhemispheric differences in Holocene carbon cycling and contribute to an understanding of the role of the ocean-sea ice system to the evolution of atmospheric greenhouse gases.

The used models are the CCSM3 (NCAR), the GCMs CAM3 and ECHAM 4.5 atmosphere models and the RCM REMO all enabled for simulating isotopes, as well as the MPI-OM1 ocean model are focus of the working group. All these different models are already implemented on a supercomputer like the IBM Power 6 (same architecture). So it looks promising to get the models running within a short time for set up.

The outcome of this project will benefit existing international, scientific collaborations (within Germany: AWI, MPI-Hamburg, PIK, Universität Bremen, and Universität zu Köln). Furthermore, the Centre for Ice and Climate is participating at the COSMOS Paleo Modelling initiative.