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Impact of freshwater pulse in a fully climate system

G. Philippon (1), S. Charbit (1), M. Kageyama (1), C. Ritz (2), G. Ramstein (1)

(1)LSCE/IPSL, Laboratoire CEA-CNRS-UVSQ, Gif-sur-Yvette, France, (2) Laboratoire de Glaciologie et Géophysique de l'Environnement, Saint Martin d'Hères, France

(Gwenaelle.Philippon@cea.fr / Fax: +33-1-69-08-77-16 / Phone: +33-1-69-08-31-97)

The Antarctic and the Northern Hemisphere ice sheets have represented a huge reservoir of freshwater during the last glacial-interglacial cycles. Some studies showed that the release of this freshwater may change the thermohaline circulation and therefore the heat inter-hemispheric gradient. This may impact the surface temperature and the mass balance of the ice sheets.

We present two kinds of experiments: one with a freshwater pulse in the north high latitude and the second one with a freshwater pulse in the south high latitudes. In this case, a full coupled model between ice sheets and climate is required. A climate model of intermediate complexity (CLIMBER) has been coupled to a three-dimensional thermomechanical ice sheet model for both Antarctic and Northern Hemisphere (called GRISLI and GREMLINS respectively). With this new tool we present various scenarios for different climates. We also investigate the impact on the surface ice sheets.