



Comparative study of Arctic sea ice response from NEMO-LIM3 to two different atmospheric forcings

Francois Massonnet (1), Thierry Fichefet (1), Hugues Goosse (1), Pierre Mathiot (1), Christof König Beatty (1), Martin Vancoppenolle (1,2)

(1) Université Catholique de Louvain, Institut d'Astronomie et de Géophysique Georges Lemaître, Louvain-la-Neuve, Belgium, (2) Department of Atmospheric Sciences, University of Washington, Seattle, USA

Sea ice plays a key role within the climate system as it is, e.g., an efficient barrier to transfers of heat, mass and momentum between atmosphere and ocean. In order to simulate the observed sea ice state, global Ocean General Circulation Models (OGCMs) must benefit from good quality atmospheric forcings. NEMO-LIM3 is one of those OGCMs. This model results from the coupling of the sea ice model LIM3 with the ocean model OPA. So far, the NCEP/NCAR reanalysis dataset (2-m atmospheric temperatures and 10-m wind speeds) has been used jointly with monthly climatologies of relative humidity, cloudiness and precipitation to set up and calibrate NEMO-LIM3. Clear biases in model outputs have been tentatively attributed to this forcing. Here, we investigate the consequences of using the ERA-40-based DFS4 forcing on an ORCA1 configuration (1° resolution), with focus on the Arctic sea ice. Using an adequate metric, we measure the discrepancies between the simulations resulting from the respective forcings. A particular attention is paid to the sea ice features along Siberia at the beginning of the 80s, as previous NEMO-LIM3 runs with the NCEP/NCAR forcing exhibit a significant overestimation of ice extent in this area during this time period.