



Sensitivity of sea ice initialisation in a coupled global ocean-ice model

Yongming Tang

ECMWF, Reading, United Kingdom (Yongming.Tang@ecmwf.int)

Because sea ice is an integral part of the global climate system, its initialisation through the assimilation of available data is crucial for obtaining reliable seasonal and decadal forecasts. This paper reports three contrasting sea ice numerical experiments, using the the NEMO ocean model and the LIM2 sea ice model. These are a forced reference simulation, without any sea ice data assimilation, and two simulations where the sea ice concentration from observations is used to constrain the numerical model. One nudging scheme has a spatially uniform relaxation time scale, and the other has a spatially-varying relaxation time scale. We find discernible differences, both between each of these three simulation runs, and between the model outputs and the data sets, for both Arctic sea ice extent and especially for the sea ice volume. Comparison of the sea ice thickness with satellite observations would suggest that the simulation with the spatially-varying nudging scheme produces better agreement with the available observations, than either of the other two simulations. In particular, we find that the reference simulation has a weaker Atlantic meridional overturning circulation (AMOC) with a shallower mixed layer, than either of the constrained simulations.