



Arctic Sea Ice Thickness Variability over the 20th Century in coupled Climate Models and Ocean-Sea Ice Hindcasts

R. Gerdes (1,2), C.Koeberle (1)

(1) Alfred-Wegener-Institut, Bremerhaven, Germany, (2) International University Bremen, Bremen, Germany (Ruediger.Gerdes@awi.de / Phone:+49-471-48311827)

The representation of sea ice dynamics and thermodynamics in coupled climate models has improved considerably in recent years. How good are the sea ice simulation results submitted for the 4th assessment report of the IPCC? Here, we focus on Arctic sea ice thickness variability over the second half of the 20th century. Sea ice thickness observations for validation are very scarce. We resort to results from hindcasts with ocean-sea ice models driven with realistic atmospheric forcing. We first assess the sea ice results of hindcasts of different sea ice-ocean models that participated in the Arctic Ocean Model Intercomparison Project (AOMIP). The results are such that we think that they can serve as a benchmark for the performance of climate models in the climate of the 20th century experiment (20C3M). Multi-decadal sea ice volume variability is larger in the hindcasts than in most coupled models. This indicates that the corresponding atmospheric variability in the coupled models is too weak. In contrast to the climate models, significant trends over the whole period since 1950 cannot be identified in the AOMIP results although there are strong trends over sub-periods. We shall present first results of a hindcasts with AWT's NAOSIM (North Atlantic/Arctic Sea Ice Ocean Model) that cover the whole 20th century. Over this period, it is possible to distinguish a clear negative Arctic sea ice thickness trend from the multi-decadal fluctuations in Arctic ice volume.