



## Multi-decadal Variability of simulated Sea Ice Cover

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We investigate the multi-decadal variability of sea ice cover (SIC) in pre-industrial control simulations using the ECHAM5/MPIOM atmosphere-ocean coupled model in different horizontal and vertical resolution set-ups. Prominent multi-decadal, internal variability emerges in the time series of annual maxima and minima of SIC for both hemispheres, with the exact frequency and amplitude depending on the model resolution.

Wavelet analysis is used to detail the time-varying characteristics of the multi-decadal northern and southern hemisphere SIC variability, as well as to assess the dynamical inter-hemispheric SIC phasing. Similarly, we investigate the dynamical relation of SIC with prominent modes of multidecadal climate variability, such as the Pacific Decadal Oscillation and the Atlantic Multidecadal Oscillation, and further assess the large-scale oceanic circulation variability and associated meridional heat transports, as a potential major contributor to the simulated multidecadal SIC variability.

Additionally, we study an ensemble of transient forced simulations with natural and anthropogenic forcings covering the last millennium, in order to assess how external perturbations affect the internal SIC variability.