



Interannual variability of the Arctic summer sea-ice cover

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The possible disappearance of the Arctic summer sea ice and its time are currently discussed among climate researchers in view of the rapid decrease of the summer sea-ice cover in recent years. Whether this decrease represents a climate change signal caused by anthropogenic influence or an extreme manifestation of internal climate variability is still unclear. By means of a 20-year simulation of a coupled regional pan-Arctic atmosphere-ocean-ice model for the 1980s and 1990s and comparison of the model results with SSM/I satellite-derived sea-ice concentrations, the patterns of maximum amplitude of interannual variability of the Arctic summer sea-ice cover are revealed. They are shown to concentrate beyond an area enclosed by an isopleth of barotropic planetary potential vorticity that marks the edge of the cyclonic rim current around the deep inner Arctic basin. It is argued that the propagation of the interannual variability signal farther into the inner Arctic basin is likely to be possible owing to changes in the oceanic circulation. Such changes could be jointly responsible for the exceptionally strong decrease of the summer sea-ice cover during the last years when sea-ice decay was promoted by anomalous atmospheric circulation patterns.