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Multidecadal climate variability in Arctic and North Atlantic in climate model INMCM4

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Data of 500-year preindustrial control run of climate model INMCM4 shows distinct climate vatiability in Arctic and North Atlantic with period of 35-50 years. The variability can be seen as anomalies of upper ocean salinity and temperature that appears in Arctic and propagates to North Atlantic. The nature of oscillation is similar to "temperature Rossby waves" proposed in Dijkstra et al. 2006, but with southward propagation in Arctic – Atlantic region rather than westward propagation in North Atlantic region only. The second difference is crucial role of salinity rather than temperature in formation of density anomalies. Phase shift of a quarter of period between zonal and meridional potential density gradient as well as between zonal and meridional currents are shown. Ensemble of decadal predictions with climate model INMCM4 started from 1995 shows that warming in Barents sea observed in 2000-2010 can be reproduced by 8 of 10 ensemble members. Arctic climate predictability in this case is associated with proposed mechanism of 35-50 year Arctic-Atlantic oscillation.