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Influence of North Atlantic Sea Surface Temperature on NAO and European Winter Climate

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The Atlantic multidecadal variability (AMV) is suggested to be a source of variations in European climate. One possible mechanism is a change in the atmospheric circulation system. We focus on the effect of the AMV on the NAO, influencing European weather and climate extremes. The presented modeling study aims at the attribution of modeled and observed changes in European climate to warm and cold phases of the AMV.
The model used is the atmosphere general circulation model ECHAM6 with a horizontal resolution of T63 and 47 vertical levels up to 0.01 hPa. The sensitivity experiments use different North Atlantic sea surface temperature and sea ice patterns at the lower boundary reflecting a positive or respectively a negative phase of the AMV. These patterns are composites from a 1000 years pre-industrial control run. In the reference simulation the climatology of sea surface temperature and sea ice is applied.
The investigation includes spatial patterns and relative frequencies of the NAO and related changes in European winter temperature, temperature extremes and precipitation.