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The impact of Atlantic Multidecadal Variability on Baltic Sea temperatures limited to winter

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We analyze multidecadal temperature fluctuations of the Atlantic Ocean and their influence on Northern Europe, focusing on the Baltic Sea, without a priori assuming a linear relationship of this teleconnection. Instead, we use the method of low-frequency component analysis to identify modes of multidecadal variability in the Baltic Sea temperature signal and relate this signal to the Atlantic climate variability. Disentangling the seasonal impact reveals that a large fraction of the variability in Baltic Sea winter temperatures is related to multidecadal temperature fluctuations in the North Atlantic, known as Atlantic Multidecadal Variability (AMV). The strong winter response can be linked to the interaction between the North Atlantic Oscillation and the AMV and is maintained by oceanic inertia. In contrast, the AMV does not influence the Baltic Sea's summer and spring water temperatures.