



## **Analysis of the (N)AO influence on alpine temperatures using a dense station dataset and a high-resolution simulation**

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Both the North Atlantic Oscillation (NAO) and the Arctic Oscillation (AO) have a strong influence on European climate due to the change in the intensity and location of the westerlies, especially in winter (DJF). Their influence on the climate of the European Alps, with their very complex topography, has been analysed in earlier studies either based on a few single stations or on gridded data not higher resolved than 1 deg. To analyse finer structures in the temperature response to the (N)AO caused by the complex topography, a very dense homogenised station dataset (extended version of HISTALP), as well as a high-resolution (1/6 deg.) model simulation performed with the regional climate model REMO, have been used in this study for the winters 1958/59 to 1998/99 in the Greater Alpine Region.

In general the correlation between the (N)AO index and temperature is large north of the Alps and small or negative south of the Alps. However, substantial differences between the NAO and AO temperature signals have been found in the station dataset. The AO has the strongest influence on winter temperature at high elevation stations (above 1500 m above mean sea level) which is not visible for the NAO. These results will be compared to earlier studies and the structure of the (N)AO temperature signal will be discussed in more detail. The temperature simulated by the high-resolution regional model is highly influenced by the (N)AO in an area along the southern side of the main ridge and not at the highest gridpoints. This difference to the results based on the station dataset will also be discussed.