



## **Atmospheric heat transfer to the Arctic under main synoptic processes**

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Arctic - mid-latitude teleconnections are operating in both ways and behind them are potentially some causes of the enhanced Arctic warming (e.g., through heat transfer from lower to higher latitudes) and the feedbacks from the Arctic climate to the mid-latitude weather patterns. In order to explain the variability of the surface air temperature in the Arctic, we aim to analyse the typical synoptic situations that, we hypothesize, are characterized by a specific patterns of heat exchange between the Arctic and mid-latitudes. According to classification of synoptic processes in the Arctic developed at the Arctic and Antarctic Research Institute (AARI) in St. Petersburg major typical groups of synoptic situations in the Arctic are few (six). They correspond to position and intensity of low- and high-pressure centres. Therefore, the whole data sample for the winter period for the entire period of instrumental observations (archive exists back to 1939) can be split into six groups that sub-sample each of six groups/types of synoptic situations. Then heat transfer to the Arctic can be estimated as the divergence of the horizontal (advective) heat flux (the product of wind speed and temperature gradient) within each vertical atmospheric layer, which is calculated based on the ERA Interim Reanalysis data for the winter season (1979-now). Mapping heat divergence fields will reveal the main mid-latitude sources of heat transported to the Arctic, average for the whole data sample and for each of the six main groups of synoptic situations.

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