



Influence of SST anomalies in low latitudes on atmospheric heat transport to the Arctic

Genrikh Alekseev (1), Svetlana Kuzmina (2), and Natalia Glok (1)

(1) Arctic and Antarctic Research Institute, St.-Petersburg, Russian Federation (alexgv@aari.ru), (2) Nansen Centre, St. Petersburg, Russian Federation (svetlana.kuzmina@niersc.spb.ru)

The purpose of the study is to assess the influence of SST anomalies in the low latitudes of the Atlantic, Indian and Pacific oceans to climatic change of the winter atmospheric meridional heat transport (MAHT) to the Arctic and to propose the mechanisms of this influence. Estimates of sensible and latent heat transport to the Arctic through the "Atlantic Gate" at 70 ° N in winter (December-February) 1980-2015 fulfilled on base ERA / Interim and monthly SST from HadISST were used. Multi-dimensional cross-correlation analysis was applied. The area and month in each ocean were found with maximal correlations between SST and winter MAHT. Mean SST in selected areas for each month of 1980-2015 were calculated and its correlations with MAHT were estimated. The correlation coefficients equal from 0.57 to 0.42, and after removing the noise increased up to 0.75 with MAHT lag from 27 to 30 months. The SST and MAHT series include together with positive trend the 5-7 years fluctuations. The mechanism of SST anomalies influence on winter MAHT to the Arctic includes the interaction of atmospheric (Hadley and Ferrel circulations, jet streams, NAO) and oceanic (Gulf Stream, the North Atlantic, the Norwegian currents) circulation patterns. To justify the proposed scheme the evaluation of the links between SST anomalies, the NAO index, the Atlantic water inflow to the Barents Sea, are investigated. The study is supported with RFBR project 15-05-03512.