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Title: *Abstract title: Temporal and spatial characteristics of water of the Atlantic and the local origin found in Hornsund Fjord*

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Abstract text

In recent years the Arctic fjords have become more important in sense of understanding climate changes and are in the focus of many studies. The knowledge of hydrographical, meteorological and cryosphere conditions in the fjord, as the transition zone between open water and the land, is necessary and it constitutes a major step to understand relationships at water – land (glaciers) – atmosphere boundary, processes governing the circulation in the basin and further to determine its role in changes in stability of tidewater glaciers.

Hornsund, the most southerly fjord in the West Spitsbergen, has been investigated by the scientists from the Institute of Oceanology PAS since 2001. CTD measurements has been carried out during summer AREX cruises on board the r/v Oceania. In 2010 and 2011 the field campaigns from early spring to late summer took place under the AWAKE project and were continued in 2012. During this time the mooring systems have been deployed in the fjord and at the mouth of the fjord, providing a year - long hydrographic data sets.

11-year time series showed significant from summer to summer changes of water properties of the Atlantic and the local origin along fjord axis, especially in the potential temperature. Since 2007 the gradual decrease of physical parameters has been observed. However, the warming up and strengthening of the West Spitsbergen Current, flowing northward along the continental slope, was reflected in the fjord by the increase of water potential temperature and salinity of the Atlantic origin. The recent warm event observed in 2012 resulted in significant changes in the basin. Due to the evident inflow of Atlantic water recorded in February at the mouth of the fjord, warm winter with practically no ice production could largely contribute to the lack of Winter Cooled water layer in summer in the most inner bay, Brepollen, where its presence was common for many years.