



Northward propagation of warm signal within the West Spitsbergen Current

W. Walczowski, J. Piechura

Institute of Oceanology, Polish Academy of Sciences, Poland, (walczows@iopan.gda.pl / Fax (+48 58) 551 21 30)

The West Spitsbergen Current (WSC) structure, Atlantic Water (AW) salinity, temperature and heat content investigated upstream the Fram Strait (FS) inflow allows to better understand or even predict trends in the transports into the Arctic Ocean (AO). Synoptic observations conducted by Institute of Oceanology in frames of VEINS, ASOF and DAMOCLES EU projects over large area of the Nordic Seas gave valuable data for analysis of the AW properties, pathways, and their variability. Since 2003 substantial warming of the WSC has been observed. During years 2004-2006, summer isotherm 5°C at 100m has moved northward with mean velocity of 0.9 cm/s. In 2006 temperature of AW core reached record-high values. Complicated pathways of warm signal propagation has been observed. There are two sources of AW warming the FS region. Core of the WSC flows along the shelf slope and inflows the AO as the Svalbard Branch. This mostly barotropic prolongation of the Norwegian Atlantic Slope Current propagates signal with mean velocity 3.8 cm/s. The second source is the western branch of the WSC which follows along the Mohns and Knipovich Ridges, as a less stable baroclinic jet of the Arctic Front. The current mostly recirculates westward, however part of AW may continue along the continental slope and inflow the AO as the Yermak Branch. Observed in summer 2005 huge heat anomalies have propagated northward with mean velocity of 1.9 cm/s. Results of these anomalies activity has been observed west of Spitsbergen in summer 2006. Probably unusual ice situation north-east of Spitsbergen in summer 2006 was also caused by inflow into AO large heat amount carried by the observed eddies. Upstream observations in the Greenland and Norwegian Seas suggest, that in summer/autumn 2006 temperature of the AW in the FS region reached local maximum and the decrease of AW temperature could be expected in the near future time, but the warm inflow into the AO will yet continue.