

B07-O19

ARCTIC OCEAN CIRCULATION CHANGES IN THE LAST DECADE, DERIVED FROM OBSERVATIONS AND MODEL INVESTIGATIONS

Michael Karcher (*Alfred Wegener Institute for Polar and Marine Research, Germany*)

Hiroshi Sumata (*Alfred Wegener Institute for Polar and Marine Research, Germany*)

Benjamin Rabe (*Alfred Wegener Institute for Polar and Marine Research, Germany*)

Takashi Kikuchi (*JAMSTEC, Japan*)

Frank Kauker (*Alfred Wegener Institute for Polar and Marine Research, Germany*)

Ruediger Gerdes (*Alfred Wegener Institute for Polar and Marine Research, Germany*)

Michael.Karcher@awi.de

The sea ice and surface circulation of the Arctic Ocean is characterized by the large anticyclonic Beaufort Gyre in the Amerasian Basin and the Transpolar Drift which carries sea ice and water from the Siberian shelves to Fram Strait. At mid-depth below the Polar mixed layer and the halocline, the Atlantic Water layer is fed from water of Atlantic origin entering through Fram Strait and the Barents Sea. Based on observations from the 1980s and 1990s the canonical pattern of circulation for this water is a cyclonic flow in boundary currents along the slopes of the Arctic Ocean basins before it leaves through the Fram Strait.

More recently observations and model results indicate that this circulation pattern may be subject to change. More specifically, model results using 129 Iodine as a tracer for Atlantic derived water suggest a change of circulation in the Amerasian Basin such that parts of the Atlantic Water Layer are circulation anti-cyclonically since about 2005. Can we find observational evidence for such a change?

We will present an analysis of observed data of temperature and salinity, as well as supporting tracer data, which support the model-based suggestion of changes in key elements of the Atlantic Water layer circulation in the Amerasian Basin. The data stem from a variety of Arctic Ocean expeditions from the 1990s to the most recent sections taken in 2013. We will discuss the potential causes for these changes and its relation to the surface circulation as well as potential