Geophysical Research Abstracts
Vol. 18, EGU2016-14479, 2016
EGU General Assembly 2016

Temporal and spatial variability of the Denmark Strait Overflow

Martin Moritz, Nuno Nunes, Kerstin Jochumsen, and Detlef Quadfasel
University of Hamburg, Institute of Oceanography, Hamburg, Germany (martin.moritz@uni-hamburg.de)

The Denmark Strait Overflow (DSO) represents about half of the export of dense waters formed in the Nordic Seas to the deep circulation in the North Atlantic. The passage connecting the two is wider than the Rossby radius of deformation, and highly variable meso-scale current fluctuations are observed in the overflow. In the summer of 2014, the mooring array used for monitoring the Denmark Strait Overflow was expanded from two to five moorings in order to better resolve its spatial variability. Continuous measurements of the velocity field were made using four acoustic profilers (ADCP) and one point current meter (RCM). The instruments were deployed along the sill between the deepest point and 33 km westward of it, towards the Greenland shelf. A descriptive analysis of the structure of the velocity field at the Denmark Strait sill is presented, along with its spatial and temporal variability. The fluctuations are dominated by passing meso-scale vortices, pulsating changes in the strength of the overflow and shifts in the location of the Polar Front. These changes and their respective contribution to the variability of the flow field are discussed with relation to the different source water masses for the DSO. The relationship between spatial coherence and temporal variability on daily to monthly time scales is explored, and the influence of meso-scale eddies on daily to weekly transport estimates is quantified. The results of the analysis are used to develop a measurement strategy for unbiased DSO transport estimates.