



Multiannual to decadal circulation variability in the deep subpolar North Atlantic – A modal decomposition of Deep Water export from the Labrador Sea, sea level pressure and atmospheric forcing fields.

Jürgen Fischer, Johannes Karstensen, Martin Visbeck, Rainer Zantopp, and Robert Kopte
GEOMAR, Helmholtz Centre for Ocean Research Kiel, Kiel, Germany (jfischer@geomar.de)

The exit of the Labrador Sea is the location where different elements of the deep MOC limb merge in the Deep Western Boundary Current. Multiannual to decadal variability dominates the longer time scales with strong dissimilarities across the North Atlantic Deep water layers. While the overflow transport contributions (DSOW and NEADW) exhibit nearly decadal oscillations, the overlying LSW layer is much more constant over the observational time period – 1997 to 2012. The observations are obtained from a combination of moored current meter records and shipboard observations by direct current profiles from CTD/LADCP casts.

Although our records are long enough to apply spectral analysis methods on short time scales including seasonal, they are not long enough to perform a spectral analysis of multiannual to decadal variations. We therefore use Singular Spectral Analysis (SSA) techniques to separate the transport records into trends, non-harmonic oscillations, and noise. Temporal modes of transports are compared with sea level pressure, NAO and other climate relevant indices.