

OVIDE-A25, a biennial hydrographic transect across the North Atlantic Subpolar Gyre: Overview of the recent scientific findings

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A region crucial for the meridional overturning circulation (MOC) is the northern North Atlantic, where waters transported northward in the MOC upper limb gain density and eventually sink into the southward flowing lower limb. The variability of the subpolar gyre circulation, the MOC and the heat flux were quantified from a joint analysis of hydrographic and velocity data from nine repeats of the Greenland to Portugal OVIDE-A25 section covering 1997-2016. Then, monthly MOC and heat flux time series covering 1993-2016 were built upon altimetry and Argo data at the OVIDE section location and analyzed. The MOC shows a dominant 8-year period variability co-varying with the densest part of the DWBC off Labrador, and for which a driving mechanism is here evidenced observationally for the first time. Within *Walin's formalism* and the sole use of surface data, we demonstrate a tight link between MOC variability at A25-Ovide and surface-forced water mass transformation north of the section, before extending such a link to the entire subpolar domain.