Geophysical Research Abstracts
Vol. 14, EGU2012-1052, 2012
EGU General Assembly 2012

Interannual variability of water masses transports across A25-OVIDE section (subpolar atlantic gyre)

L.I. Carracedo (1), M. García (1), H. Mercier (2), P. Conde (1), P. Lherminier (2), F.F. Pérez (1), and M. Gilcoto (1)

(1) Instituto de Investigaciones Marinas, Oceanología, Spain (lcarracedo@iim.csic.es), (2) Laboratoire de Physique des Oceans, Ifremer, Plouzané, France

The Ovide (Observatoire de la Variabilité Interannuelle à DEcennale) project has consisted on repeated trans-oceanic hydrographic section from Greenland to Portugal every other year (from 2002 to 2010). This project is part of the CLIVAR (Climate Variability and Predictability) and CARBOOCEAN international programs, both focused on ocean climate variability. The section crosses the main currents implicated in the North Atlantic Meridional Overturning Circulation (MOC), and is very close to the previous A25 section ("Fourex") of the WOCE (World Ocean Circulation Experiment) performed in 1997.
The North Atlantic Ocean plays a crucial role in the global thermohaline circulation as can be considered the departure point of the MOC, where the warm salty waters are transformed by deep winter convection into deep waters. The water mass distribution in the section is derived by means of OMP method for every cruise, and then combined with absolute velocity fields to provide the relative contribution from each water mass to the final transport values. The water mass circulation pattern across the section is then discussed within the context of interannual variability of the main MOC components, in terms of the different water mass components. The mean transport for each of these water masses results in 11.7 $\pm$ 2.6 Sv (1 Sv = 106 m3 s^{-1}) for central waters, 2.0 $\pm$ 0.69 Sv for SubArtic Intermediate Water, 0.58 $\pm$ 0.51 Sv for Antartic Intermediate water and MW 0.15 $\pm$ 1.3 Sv, all of them flowing northward and contributing to the upper branch of the MOC. On other hand, the lower MOC branch transports southward -8.5 $\pm$ 2.0 Sv of LSW, -3.3 $\pm$ 0.33 Sv of Iceland-Scotland Overflow Water and -1.3 $\pm$ 0.92 Sv of Denmark Strait Overflow Water, with an almost zero net transport of North East Atlantic Deep Water of 0.17 $\pm$ 1.0 Sv. The knowledge of the variability and contribution of each water mass itself will allow a better understanding of the global circulation mechanisms in the subpolar intergyre region, which is the connection between the North Atlantic Oscillation (NAO) atmospheric forcing and the changes in production and/or advection of main water masses.