



Modal composition of the NACW at the subtropical gyre. A comparative view from BATS and ESTOC.

A. Cianca, J. Pérez-Marrero, R. Santana, M.J. Rueda and O. Llinás

Instituto Canario de Ciencias Marinas (ICCM), Apdo. 56, 35200 Telde, Spain.

(andres@iccm.rcanaria.es).

A decadal observation set (1994- 2003) made at the stations BATS (Bermuda Atlantic Time-Series) and ESTOC (European Station for Time-series in the Ocean, Canary Islands), located at both sides of the subtropical gyre (west and east, respectively) provide a coherent data set to study characteristics of the North Atlantic central water (NACW) in the area. The number of the observations and its regular time distributions reduces the significance of the seasonal/interannual variations, which can also be specifically studied as part of the station goals.

The distributions of the temperature, salinity and density from the CTD profiles just about monthly made at the stations during the decade have enabled the establishment of the NACW characteristics at both sides of the subtropical gyre. The standard curves for the eastern and western NACW in the T/S diagram have been adjusted by a least squares method (third polynomial degree). The errors estimated through the variance-covariance matrix of data, including the error from both variables show high and increasing values in the lower and higher ends of the standard curves section for the water masses. These extremes and high variability are indicative of the transition of the water mass with the surface and intermediate waters. At ESTOC errors curve, three minima are clearly marked, two of them corresponding to modal waters well established in the bibliography and named as Subpolar Mode Water (SPMW) and Madeira Mode Water (MMW). The third minima is likely a mode which has been well described in a distinctive way, though it has been generically included as part of wider definitions. This minimum is located at the T/S diagram in a potential temperature

around 13.7°C and salinity 35.88 and it would be located in around 350 m deep.

By superimposing this mode characteristic isotherm, corresponding to winter mean SST images for several years, to the area map where the mean density anomaly (from the climatology WOD2005) has been included, it was observable a most suitable region where this mode water is likely formed and it is centered around latitude 40°N.