Geophysical Research Abstracts
Vol. 16, EGU2014-4156, 2014
EGU General Assembly 2014

Properties of the Mediterranean water eddies (meddies) in the Northeast Atlantic as a function of distance from the Iberian peninsular.

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Meddies were identified from in-situ vertical casts for the period 1950-2012, obtained from the World Ocean Database provided by the National Oceanographic Data Center (http://www.nodc.noaa.gov/). All the casts passed several quality control procedures previous to the analysis. Casts across meddies were identified as salinity anomalies of more than 0.1 over 200-m depth interval observed inside the layer 500-1500 m (Richardson, 1991). The anomalies were derived relative to the MEDTRANS climatology. The "meddies" identified closer than 50 km to the Iberian coast might represent meanders of the Mediterranean Undercurrent and were excluded from the analysis.

The probability to encounter a meddy in a 1ox1o grid was estimated. The identified meddies group in 4 main paths, all having their origin at the continental slope of the Iberian peninsular and extending westwards. The paths obtained refine the paths previously identified by Shapiro et al. (1996). Secondary paths, regarded as the pathways of exchange of meddies between the main paths, were also identified.

For further identification of meddy proprieties there were used the assemblages with more than 3 casts within the 10-day and 100-km intervals around the "central" cast. The latter was selected as the cast with maximum salinity anomaly. For each of the assemblages, the following characteristics of meddies were computed: salinity maximum (Sm) and its depth (Zsm), temperature maximum (Tm) and its depth (Ztm), thickness of meddy core (H), meddy radius (R) and the total amount of salt (Svol). The two latter parameters were estimated assuming Rayleigh radial/vertical profiles of salinity distribution inside a meddy. The results were further binned as a function of the distance to the Iberian peninsular. It was found out that with the distance to the coast there were observed a gradual swallowing of the meddy cores, decrease of their vertical extension, as well as decrease of their maximum salinity and temperature. The radii of the cores and the amount of salt grew up to 500 km form the coast and started decreasing further away from the coast.