



The WMDW path from its formation place to the Gibraltar gateway.

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WMDW is present in western Mediterranean Sea between 600 and 3000 m depths (La Violette, 1994) and is characterized by salinity of around 38.4 and a potential temperature between 12.5 and 13 °C. This water mass is formed in the Gulf of Lions when winter heat losses cause deep convection (Lacombe, 1984) that carries newly formed WMDW to great depths. It appears that the new water is transported by eddy-induced processes out of the Gulf of Lions along the eastern coast of the Majorca Island. From here WMDW would accumulate at depths greater than 2000m in the Algero-Provencal basin extending westward into the Algerian basin where it flows toward Gibraltar.

This WMDW formed in the Gulf of Lions flows below 600m and plays an important but relatively unknown role in the deep circulation of the western Mediterranean. The WMDW main path is counter-clockwise in the western Mediterranean and is perturbed by Algerian eddies (Demirov, 2006). It remains uncertain what causes the interannual and annual variability of the WMDW and what is its contribution to the outflow in the strait of Gibraltar, which appears to be a bit warmer in winter and cooler in late spring (García-Lafuente et al., 2007). The cold signature could indicate more proportion of WMDW in the outflow.

A high resolution numerical model of the Mediterranean sea has been used to follow the WMDW from its formation place to the strait of Gibraltar where it flows out the Mediterranean. Seasonality and interannual variability of WMDW formation is here analyzed as well as its relation with the volume of WMDW volume outflowing Mediterranean.