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Structure and Temporal Variability of Mediterranean Water in Hydrological and Marine Seismic Data South of Portimao Canyon (Gulf of Cadiz), from 1999 to 2002

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ABSTRACT

Hydrological and marine seismic data, collected in the Gulf of Cadiz (respectively in July 1999, 2000, 2001 and 2002, and in April 2000 and 2001) are analysed to reveal the various structures of Mediterranean Water (MW). Both the hydrological and seismic data clearly identify the MW undercurrents on the Iberian slope, detached MW eddies (meddies and a cyclone) and smaller fragments of MW (filaments and small eddies). Seismic reflectivity and synthetic reflectivity computed from hydrology, indicate that strong acoustic reflectors, associated with 8 - 64 m thick homogeneous water layers, are found above and below meddies and filaments, around the MW undercurrents, but mostly in the lower part of cyclones and below submesoscale eddies. Reflectors are also observed in the near surface layers where thermohaline contrasts are quite pronounced. The successful use of seismic data to locate submesoscale MW structures, superior to that of hydrology, is related to the improved horizontal resolution.

KEYWORDS

Mediterranean Water, Eddies, Undercurrent, Layering, Hydrological Data, Seismic Reflectivity, Submesoscale Structures

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