Persistence of an eddy signature in the central Tyrrhenian basin

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Abstract

During July and December 2005 two basin-scale hydrographic cruises were performed in the Tyrrhenian basin to monitor hydrographic conditions after the significant changes observed during previous decades. A detailed investigation of the surface layer suggested the presence of a mesoscale structure in the central basin, off Naples. Its principal feature is a subsurface cold lens of Western Intermediate Water, a water mass produced in the Northwestern Mediterranean during the winter season. The lens, which appears as an anticyclonic eddy, was detected for the first time in July. Five months later an eddy signature was detected in the same position with the same hydrographic characteristics. The positive altimetric anomaly in correspondence with the observed structure suggests that the anticyclonic circulation lasted for a long period and its persistence was related to the presence of a seamount in the region. For the first time the importance of isolated topography in influencing the interior Tyrrhenian circulation is highlighted: the Vavilov Seamount, jointly with the weak mean current, seems to be responsible for the persistence of eddy structures in the region. The topographic effect is discussed on the basis of the eddy properties and theoretical findings.

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