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R. Balbín, M.M. Flexas, J.L. López-Jurado, M. Peña, A. Amores, F. Alemany, (2012). [Vertical velocities and biological consequences at a front detected at the balearic sea](#)
. Continental Shelf Research. Volume 47, 15 September 2012, Pages 28–41.

Abstract: An intense oceanic front was detected at the west of Mallorca Island (Balearic sub-basin of the North Western Mediterranean Sea) during an oceanographic survey in December 2009. This contribution analyses the hydrography and geostrophic motions observed at the front, together with the ageostrophic motion derived from the omega equation. The front separated resident Atlantic water (to the north) from more recent Atlantic water (to the south). Maximum upward vertical velocities of 6 m/day were found at the northern side of the front, related with relative maxima of dissolved oxygen and fluorescence. The vertical velocities in this study are mainly due to relative vorticity advection. AVISO altimetry data is used to discuss the advection of the front over a nearby mooring equipped with temperature and salinity sensors at 300 m below the sea surface. The biological implications of the front are discussed by means of acoustic backscatter data. There is an observed increase in mesopelagic fish biomass at the frontal area. Our hypothesis states that the vertical velocities associated to the front would lead to the observed increase in mesopelagic biomass near the front, which is in agreement with previous studies in other frontal systems.

Keywords: Ocean circulation, Vertical velocities, Water masses, Plankton distribution, Western Mediterranean Sea, Balearic Sea