



Characteristics of Geostrophic Eddies in the North Western Mediterranean as observed by Gliders and simulated by a high-resolution Model: formation, behaviour and dissipation

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Since 2008, gliders repeated transects crossing the basin of the North Western Mediterranean Sea and regularly sampled mesoscale structures with an high horizontal resolution of about 2-3 km between each profile required in that region of small internal deformation radius (<10km).

By analysing more than 50 000 profiles collected by these gliders in the last 5 years, we were able to identify several types of eddies regarding the water mass composing their cores: Winter Intermediate Water (WIW), Levantine Intermediate Water (LIW), Western Mediterranean Deep Water (WMDW). Most of them are anticyclonic structures with Rossby Number greater than 0.1 and tend to be characterized by a core in the inner ocean. Some of them whose formation has been dated several months back in time can be qualified as long lived features. Of particular interest to assess the role of mesoscale eddies in the ocean circulation, a Submesoscale Coherent Vortex (SCV) composed of newly WMDW was observed nine months after its formation.

We also used a 1 year run of a high resolution (1km, 40 vertical levels) numerical model of the region (SYMPHONIE) which is able to reproduce similar eddies.

In this study we discuss their formation process (instability of the boundary current, or diapycnal mixing followed by geostrophic adjustment) based on comparisons between these observations and the model outputs, and try to estimate their impact on the general circulation of this basin.