

ALBOREX: an intensive multi-platform and multidisciplinary experiment in the Alboran Sea

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An intensive multi-platform and multidisciplinary experiment was completed in May 2014 as part of PERSEUS EU Project. 25 drifters, 2 gliders, 3 Argo floats and one ship were dedicated to sample an area of about 50x50 km in the eastern Alboran Sea during one week. The experiment, which also includes 66 CTD stations and 500 water samples (salinity, chlorophyll and nutrients), was designed to capture the intense but transient vertical exchanges associated with mesoscale and submesoscale features.

The vertical motion associated with mesoscale and submesoscale features such as ocean eddies, filaments and fronts plays a major role in determining ocean productivity, due to the exchange of properties between the surface and the ocean interior. Understanding the relationship between these physical and biological processes is crucial for predicting the marine ecosystems response to changes in the climate system and to sustainable marine resource management. However, to understand the links between mesoscale and submesoscale features and ecosystem responses, it is necessary to collect data at a range of temporal and spatial scales, and then combine these data with coupled physical and biochemical models.

Data from thermosalinograph revealed a sharp surface salinity front with values ranging from 36.6 (Atlantic Waters) to 38.2 (Mediterranean Waters) in conjunction with a filament in temperature. Drifters followed a massive anticyclonic gyre. Near real time data from ADCP showed coherent patterns with currents up to 1m/s. Gliders detected a subduction of chlorophyll located in areas adjacent to the front. We also present results on the horizontal strain rate, relative vorticity and quasi-geostrophic vertical motion to understand the dynamics of this intense ocean front.