



## **PROTEVS-MED field experiments: High Resolution Hydrographic Surveys in the Western Mediterranean Sea focused on mesoscale to submesoscale structure.**

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From 2015 to 2018 five fields experiments have been performed in the Western Mediterranean Basin during winter or early spring in order to catch small structures which short lifetimes with almost not signature on remote sensed fields (altimetry nor temperature).

We intensively used a towed vehicle undulating in the upper oceanic layer between 0 and 400 meter deep (a Seasoar) where the dynamics are intensified. A lot of very high resolution hydrographic transects (more than 3000 nautical miles) have thus been undertaken, crossing mesoscales dynamics (slope current and instabilities, anticyclonic eddies, sub-mesoscales coherent vortices, frontal dynamics convection events, straits outflows) or sub-mesoscales processes like stirring, mixed layer or symmetric instabilities. the hydrological data were completed with dynamical information recorded by vessel mounted ADCP and by surface salinity and temperature. Some CTD casts have been also performed giving the hydrography of the background and in 2016 some transects were sampled with a Moving Vessel Profiler( MVP).

The approach is additional to what we can get with repeated glider transects such as these of the MOOSE network. It differs from these kind of data by the space and time resolution we may reach (less than 2 nautical miles over the horizontal direction).

This data set is an unprecedented opportunity to investigate very fine scale processes as the Mediterranean Sea is known for its strong and contrasted dynamics.

An overview of the observed processes will be first presented and discussed regarding meso- and submeso-scale concepts. Attention will be paid to the heterogeneity of surface eddies, revealing unexpected (or yet unobserved) particular structure (dual core eddy, multi-layered eddies, density compensated structures, ageostrophic dynamics).