SeaGoLSWOT: an oceanographic campaign in support of the AirSWOT mission in the Northwestern Mediterranean

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Abstract

One of the main goals of the Surface Water and Ocean Topography (SWOT) mission is to provide measurements of sea surface height at a resolution of few km over a swath of 100 km. Such observations will allow to reconstruct the dynamics associated with (sub)mesoscale structures, characterized by spatial scales on the order of tens of km. The SWOT mission will be particularly important for coastal regions, where traditional altimetry observations are currently inaccurate. SWOT observations will allow a more reliable analysis of coastal transport and dispersion, which will provide key information for the development of a sustainable management of those regions.

The launch of the SWOT satellite is currently scheduled for Fall 2020. Before then, the performance of the SWOT altimeter will be tested within the AirSWOT program. AirSWOT will be based on an airborne version of the SWOT sensor, and will consist in a series of flight missions over key coastal regions. Each mission will be associated with an accompanying oceanographic campaign, which will allow to compare and calibrate/validate the high-resolution altimetry measurements with *in-situ* observations.

SeaGoLSWOT is the field campaign associated with the AirSWOT mission over the Gulf of Lion (Northwestern Mediterranean) currently scheduled for Fall 2014. The main goal of the campaign is to collect a series of three-dimensional mappings of physical and biological variables across identified (sub)mesoscale features. The campaign will be based on an adaptive sampling strategy which will allow to design/optimize the sampling pattern of each mapping according to the characteristics of the local dynamics retrieved from the near-real time analysis of satellite imagery and previous mappings.

The *in-situ* measurements will include Lagrangian drifter trajectories, which will provide information on the local and larger scale surface transport patterns; vertical sections of physical and bio-optical variables from gliders and a ship-towed profiler, which will be used to reconstruct the quasi-synoptic three-dimensional structure of the observed (sub)mesoscale features; and surface phytoplankton assemblages from a bench flow cytometer, which will allow to reconstruct the horizontal distribution of different phytoplankton groups.

Integrated together, the observations from the various platforms will allow to address three key objectives within the AirSWOT program: (i) Provide AirSWOT measurements with a ground truth of the physics at $\sim$1 km horizontal resolution in the upper 100 m of the water column; (ii) Test and tune novel *in-situ* sampling strategies and instrument configurations to be used during future AirSWOT flights; (iii) Investigate the link between the $\sim$10 km horizontal surface structures to the dynamics and the biogeochemical processes within the upper layer of the water column by integrating *in-situ* and AirSWOT measurements.