



Remote sensing validation through SOOP technology: implementation of Spectra system

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The development of low-cost instrumentation plays a key role in marine environmental studies and represents one of the most innovative aspects of marine research.

The availability of low-cost technologies allows the realization of extended observatory networks for the study of marine phenomena through an integrated approach merging observations, remote sensing and operational oceanography.

Marine services and practical applications critically depends on the availability of large amount of data collected with sufficiently dense spatial and temporal sampling. This issue directly influences the robustness both of ocean forecasting models and remote sensing observations through data assimilation and validation processes, particularly in the biological domain. For this reason it is necessary the development of cheap, small and integrated smart sensors, which could be functional both for satellite data validation and forecasting models data assimilation as well as to support early warning systems for environmental pollution control and prevention.

This is particularly true in coastal areas, which are subjected to multiple anthropic pressures. Moreover, coastal waters can be classified like case 2 waters, where the optical properties of inorganic suspended matter and chromophoric dissolved organic matter must be considered and separated by the chlorophyll a contribution.

Due to the high costs of mooring systems, research vessels, measure platforms and instrumentation a big effort was dedicated to the design, development and realization of a new low cost mini-FerryBox system: Spectra. Thanks to the modularity and user-friendly employment of the system, Spectra allows to acquire continuous in situ measures of temperature, conductivity, turbidity, chlorophyll a and chromophoric dissolved organic matter (CDOM) fluorescences from voluntary vessels, even by non specialized operators (Marcelli et al., 2014; 2016). This work shows the preliminary application of this technology to remote sensing data validation.