



In situ fluorescence measurements of protein-, humic- and HAP-like materials in the Northwestern Mediterranean Sea

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Understanding the biogeochemical functioning of the ocean requires high frequency measurements of dissolved organic matter (DOM) descriptors. For 10 years, the technological developments of fluorescence sensors try to cover this need. In this context, our laboratory developed the MiniFluo-UV sensor, a prototype of miniaturized submersible fluorometer for the detection of aromatic compounds that fluoresce in the UV spectral domain. The qualification of the sensor consisted in measurements of drift, linearity, repeatability, sensitivity to light, temperature and pressure, and detection limits of phenanthrene (HAP) and tryptophan (aromatic amino acid) in standard solutions. Measurements were also conducted in crude oil water soluble fractions (WSFs). The MiniFluo-UV sensor was then deployed in two distinct areas of the Northwestern Mediterranean Sea: 1) in the Gulf of Lion during the continuous monitoring of the surface water layer (DEWEX cruise, winter and spring 2013) and 2) in the Bay of Marseilles, heavily impacted by urban activities, where the sensor was mounted onto the SeaExplorer underwater glider and onto a CTD vertical profiler (July-December 2014). These platforms were also equipped with a humic-like fluorescence sensor and other sensors for hydrological and biogeochemical parameters (T, S, Chla, oxygen, turbidity). The patterns of fluorescence signatures enabled to distinguish interesting distributions of DOM in relation with hydrological features and spring biological production in the Gulf of Lion, and showed the accumulation of contaminants in marine areas under anthropogenic pressure.

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