

Accepted Manuscript

Combining laser diffraction, flow cytometry and optical microscopy to characterize a nanophytoplankton bloom in the northwestern Mediterranean

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PII: S0079-6611(17)30097-6

DOI: <https://doi.org/10.1016/j.pocean.2017.10.010>

Reference: PROOCE 1866

To appear in: *Progress in Oceanography*

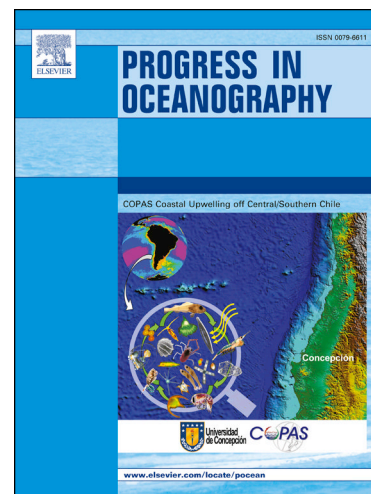
Received Date: 25 March 2017

Revised Date: 27 September 2017

Accepted Date: 18 October 2017

Please cite this article as: Leroux, R., Gregori, G., Leblanc, K., Carlotti, F., Thyssen, M., Dugenne, M., Pujo-Pay, M., Conan, P., Jouandet, M.-P., Bhairy, N., Berline, L., Combining laser diffraction, flow cytometry and optical microscopy to characterize a nanophytoplankton bloom in the northwestern Mediterranean, *Progress in Oceanography* (2017), doi: <https://doi.org/10.1016/j.pocean.2017.10.010>

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Revised manuscript

Combining laser diffraction, flow cytometry and optical microscopy to characterize a nanophytoplankton bloom in the northwestern Mediterranean

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Keywords: Phytoplankton, particles, LISST, flow cytometry, optical microscopy, POC, Mediterranean Sea.

Abstract

The study of particle size distribution (PSD) gives insights on the dynamics of distinct pools of particles in the ocean, which reflect the functioning of the marine ecosystem and the efficiency of the carbon pump. In this study, we combined continuous particle size estimations and discrete measurements focused on phytoplankton to describe a spring bloom in the North West Mediterranean Sea. During April 2013, about 90 continuous profiles of PSD quantified through in situ laser diffraction and transmissiometry (the Laser *In-Situ* Scattering and Transmissiometry Deep (LISST-Deep), Sequoia Sc) were complemented by Niskin bottle samples for flow cytometry analyses, taxonomic identification by optical microscopy and pigments quantification. In the euphotic zone, the PSD shape seen by the LISST was fairly stable with two particle volume peaks covering the 2-11 μm and 15-109 μm size fractions. The first pool strongly co-varied with the

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