

OCEAN OPTICS XXIV

Valamar Lacroma Dubrovnik Hotel | Dubrovnik, Croatia | October 7–12, 2018

<https://oceanopticsconference.org>

Monday, October 8

Poster Session 1

16:00–18:00

Poster 33

ANALYSIS OF THE SUN-STIMULATED CHLOROPHYLL FLUORESCENCE SIGNAL IN VIEW OF THE CURRENT AND FORTHCOMING SATELLITE MISSIONS

Phytoplankton organisms are able to change the observed light field through absorption, scattering and inelastic processes, such as fluorescence. Within this study we focus on the impact of fluorescence spectral features on the remote sensing reflectance (Rrs) signal, in the red and NIR wavelengths range of the visible electromagnetic spectrum. The Hydrolight code, parametrized with specific inherent optical properties of a clear lake (Garda, Italy), was run by changing the concentrations of chlorophyll-a [chl-a], total suspended matter and of the fluorescence quantum yield. The key parameter in the simulations was the Rrs peak position (Rrs-pp): to evaluate accurately these values, we parametrized the Rrs curves as sum of several components gaussian in shape (multipeak function). The values obtained were then displayed in a xy graph, for increasing [chl-a]: when fluorescence prevails (low total suspended matter and high quantum yield), a characteristic linear trend was found. On the other hand, when the elastic scattering dominates, a saturation trend was found. An exponential asymptotic function effectively matched the global Rrs-pp trends. At low [chl-a] and regardless the quantum yield, all the Rrs-pp curves show a linear growth. When elastic scattering prevails, the slopes is accentuated and the intercept lies around 688 nm. Contrariwise, when fluorescence dominates, the slope decrease and the intercept is settled to 685 nm, corresponding to the chlorophyll-a fluorescence peak emission. These results will be then evaluated with respect to experimental data gathered in the field and from airborne imaging spectrometry and Sentinel-3B (FLEX configuration).

Ilaria Cesana, CNR-IREA; UNIMIB MILANO-BICOCCA, cesana.i@irea.cnr.it

Mariano Bresciani, CNR-IREA, bresciani.m@irea.cnr.it

Claudia Giardino, CNR-IREA, giardino.c@irea.cnr.it

Sergio Cogliati, UNIMIB MILANO-BICOCCA, sergio.cogliati@unimib.it

Roberto Colombo, UNIMIB MILANO-BICOCCA, roberto.colombo@unimib.it

Vittorio Brando, CNR-ISAC, v.brando@isac.cnr.it