ANALYSES OF THE BIO-OPTICAL VARIABILITY OF VIETNAMS COASTAL SURFACE WATER FOR OCEAN COLOR REMOTE SENSING APPLICATIONS.

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Ocean color is the result of the interactions between light and optically significant components present in the seawater surface layer. The water remote sensing reflectance is directly proportional to the absorption (a) and inversely proportional to the backscattering (b_b) coefficients of the following different components: pure sea water, phytoplankton, non-algal particles (heterotrophic bacteria, detritus and minerals), dissolved matter, and air bubbles. Accurate assessment of the different in-water bio-optical components from ocean color measurements in coastal areas is largely controlled by i) our ability to understand and to account for the origin of the variability of the remote sensing reflectance (Rrs), and ii) the realism of the parameterizations used between the inherent optical properties (IOPs) and the biogeochemical component (BC). Based on in situ measurements performed during two different cruises performed in Vietnams Coastal waters of the Gulf of Tonkin, we investigate the origin of the particulate- and dissolved-IOPs variability. We specifically focus on the impact of the concentration, nature (organic vs. inorganic and living vs. non-living particles), and size of the suspended particles on the particulate absorption, backscattering, and scattering coefficients. The spectral values of the mass specific particulate and backscattering coefficients, used in semi-analytical inverse algorithms, are presented. The impact of different size classes as well as the particulate composition on the variability of these specific IOPs is closely examined. At last, new way to derive particulate organic carbon in such optically complex environment is proposed.