Wednesday, October 10
Poster Session 3
16:00–18:00

Poster 214

A SIMPLE FORMULA FOR EMPIRICAL OCEAN COLOR ALGORITHMS FOR ABSORPTION COEFFICIENT OR CHLOROPHYLL CONCENTRATION APPLICABLE FROM CLEAR TO TURBID WATERS

In the past decades for quick and easy production of chlorophyll concentration (Chl) from remote sensing reflectance spectrum (Rrs), a wide range of empirical algorithms have been developed, where separate algorithms were proposed for "clear" and "turbid" waters. Thus, if there are both clear and turbid waters in an ocean color image, an empirical switch scheme has to be designed in order to obtain a continuous image product, which usually results in jump or discontinuity of the product value at the clear-turbid boundary. To avoid this arbitrary switch and to obtain robust estimation of absorption coefficient or Chl from ocean color, we propose a simple formula (termed as OCmax2) for the empirical retrieval of Chl or absorption coefficient from Rrs. It is found that, compared to the widely used OC4-type algorithm, OCmax2 can improve the coefficient of determination (R^2) from ~0.88 to 0.99 for a(440) (the total absorption coefficient at 440 nm) in a range of ~0.01 – 20.0 m^{-1} (equivalent Chl is roughly ~0.01 > 500 mg/m^3). Especially, the sensitivity of OCmax2 to the change of a(440) is more than tripled compared to OC4 type of algorithm for a(440) > 0.3 m^{-1} (Chl roughly > 5 mg/m^3). These results indicate its robustness and seamless applicability from clear to highly turbid coastal areas that cover nearly all natural waters. Applications of OCmax2 to both in situ data and satellite images in coastal areas are further demonstrated, and advantages and limitations of OCmax2 are also presented.

Shaoling Shang, Xiamen University, slshang@gmail.com
Zhongping Lee, University of Massachusetts Boston, Zhongping.Lee@umb.edu
Gong Lin, Xiamen University, lingong@xmu.edu.cn