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### Possibility of Improving Three-Band Model for Different Species in Case II water : Evidences from Three Experiments

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#### Abstract

The remote sensing of chlorophyll-a in case II water has been far less accurate than in case I water, due mainly to the complex interactions among optical properties of phytoplankton, tripton, colored dissolved organic matter, and water turbidity. To address this problem, Gitelson *et al.* (2008) suggested a three-band model to minimize the effects of tripton, colored dissolved organic matter (CDOM) and thus promised an accurate estimation of chlorophyll-a. In this study,

datasets with different phytoplankton species to test the performance of the model developed by Gitelson *et al.* The major findings of our study are: (1) the mechanism of the three-band model could work very well for each species ( $R^2 > 0.84$ ,  $rRMSE < 23\%$ ); (2) the slope and intercept of the three-band model depended on variation of phytoplankton species; (3) chlorophyll-*a* coefficients at 440nm ( $a_{ph}^*(440)$ ) could be used to predict the slope of the three-band model for different species of phytoplankton. Compared with the original three-band model, the RMSEs of the improved three-band model were reduced from 37.2  $mgm^{-3}$  to 7.3  $mgm^{-3}$ , and from 34.3  $mgm^{-3}$  to 15.9  $mgm^{-3}$ , for Lake Tai and Lake Dianchi, respectively.

Keywords: [phytoplankton species](#), [field survey](#), [tank experiment](#), [Lake Tai](#), [Lake Dianchi](#), [water quality](#)

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