The Effect of Uncertainty in Inherent Optical Property Parameterization on Chlorophyll Retrieval from Ocean Color Spectra: A Simulation Study

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Abstract

A general approach is presented to quantify retrieval errors in in-water constituent concentrations induced by uncertainty in inherent optical property (IOP) submodel parameterization. Chlorophyll concentrations are retrieved by inverting a radiance model with nonlinear IOP submodels. We demonstrate quantitatively how uncertainty in the IOP submodel parameterization influences the accuracy of the chlorophyll concentration retrieval at different chlorophyll concentration levels. Two complete sets of simulations were designed and conducted, representing two extreme cases between which "real" cases are expected to occur. The simulations show that precise knowledge of spectral shapes of IOP submodels is important in chlorophyll retrieval.