

# RETRIEVAL OF OCEANIC PHYTOPLANKTON WITH A COMBINED PHYTODOAS-RTM METHOD UTILIZING HYPER SPECTRAL SATELLITE MEASUREMENTS

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Global information on the quantitative distribution of major phytoplankton functional types (PFTs) of the world ocean is important for understanding the marine phytoplankton's role in the global marine ecosystem and its impact on global climate.

In this study an improved Phytoplankton Differential Optical Absorption Spectroscopy (PhytoDOAS) method for the retrieval of major PFTs from satellite measurements utilizing the hyper spectral instrument SCIAMACHY (Scanning Imaging Absorption Spectrometer for Atmospheric Cartography) is introduced [Bracher *et al.*, 2009; Sadeghi *et al.*, 2011].

This specialized PhytoDOAS method combines the fit algorithm with radiative transfer calculations based on a look-up table approach. For this purpose the full coupled atmospheric-ocean radiative transfer model SCIATRAN is used. The method is applied to the complete SCIAMACHY data set (2002-2011) and examples of retrieval results are shown here. Four different types of PFTs are detected simultaneously by fitting the differential specific absorption spectra of each species to the satellite measurement. These are diatoms, cyanobacteria, dinoflagellates and coccolithophores, which is dominated by the *Emiliania huxleyi* species. The global phytoplankton distributions were validated with collocated HPLC (High-Performance Liquid Chromatography) in-situ measurements and shows quite good agreement.

## REFERENCES

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