Radiative transfer sensitivity studies for detection of oceanic coccolithophore blooms from ENVISAT MERIS data

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Spectral water-leaving reflectances are influenced by (a) the composition and (b) the inherent optical properties (IOPs) of all optically active constituents in the water, as well as by (c) the concentration, and (d) the vertical distribution within the water column. Oceanic coccolithophores show distinctive IOPs enabling their detection from space for high concentrations. Results of radiative transfer simulations - performed with the Matrix-Operator-Model MOMO - show dependencies of ocean color on the composition, the IOPs, and the concentration. The sensitivity of water-leaving signals and - taking into account the atmospheric influence - top-of-atmosphere signals are studied. The results are applied to ENVISAT MERIS data to allow operational detection of coccolithophore blooms.