

OCEAN OPTICS XXIV

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Monday, October 8

Poster Session 1

16:00–18:00

Poster 73

FACING THE CHALLENGES IMPOSED BY VARIABLE CLOUD COVER ON OPTICAL FIELD MEASUREMENTS

Cloudy skies, in particular broken clouds with variable shadowing of the sun, cause illumination conditions that are usually considered to produce non-evaluable measurements for passive optical instruments. For this reason, passive spectrometers are usually utilized only at clear sky conditions, thus recording of continuous data sets can be heavily hampered by the weather conditions. We analysed a series of spectral measurements made under such unfavourable illumination conditions for their potential of reconstructing reflectance spectra and deriving colored dissolved organic matter (CDOM), phytoplankton and total suspended matter (TSM) concentrations. We found that in-water measurements of downwelling irradiance allowed estimating the concentration of absorbing water constituents (CDOM, phytoplankton), yet not TSM. A major challenge for above-water measurements are the reflections at the water surface, which can exceed the water reflectance by orders of magnitude. Applying an adapted spectral model for specular reflections demonstrated the potential for estimating phytoplankton and TSM concentration, but not for CDOM. These results may indicate the possibility of all-weather monitoring with optical measurements from various platforms operated below clouds such as ships, buoys, unmanned aerial vehicles or aircrafts.

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