Tuesday, October 9
Poster Session 2
10:30–12:30

Poster 154

BIDIRECTIONAL REFLECTANCE OF OCEAN WATERS: RE-EXAMINING VARIABILITY OF THE F/Q FACTOR IN OPTICALLY COMPLEX WATERS

The relationship between remote sensing reflectance, Rrs, and the inherent optical properties of the ocean (primarily absorption, a, and backscattering, bb) is described by the bidirectional reflectance distribution function (BRDF). Early work on this topic returned relationships for Rrs on both bb/a and bb/(a+bb) with associated variability in the relationships dealt with by variable estimates of f/Q and by adding 2nd-order terms. Recent work (Hlaing et al., 2012) has shown that Case-2 waters can be better represented by wavelength-dependent, 3rd-order polynomials operating on bb/(a+bb). More recently, there is evidence of a growing misunderstanding emerging in the community that suggests that the simpler bb/a relationships are inappropriate for Case-2 waters. In this study we use extensive Hydrolight simulations to generate a synthetic data set of spectral Rrs, a and bb values for a range of solar and sensor angles. Using a wider range of constituent concentrations than the earlier Hlaing et al. study, we find that the BRDF is well-modelled using 5th-order polynomials to ensure equivalent performance across the full range of simulated concentrations, that the BRDF is not significantly wavelength dependent and that performance of bb/a and bb/(a+bb) variants are essentially equivalent. Together with the Hlaing et al. study, these results point the way to a simple but effective set of relationships for relating Rrs, a, and bb that are sufficiently robust for operational use over the vast majority of marine waters. Demonstration that BRDF is adequately parameterised on bb/a significantly simplifies the route to spectral deconvolution of Rrs signals.

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