

OCEAN OPTICS XXIV

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<https://oceanopticsconference.org>

Thursday, October 11

Poster Session 4

10:30–12:00

Poster 64

POLARIMETRIC SCATTERING MATRICES OF MINERAL HYDROSOLS

With the upcoming launch of several Earth-observing satellites with polarimetric capability, and a rising interest in polarimetric data acquired in-situ, it is becoming increasingly important to understand the radiative properties of oceanic hydrosols in polarized mode. In this work we present the results of an experiment to measure the scattering matrices of select mineral hydrosols in a laboratory setting. The full 16x16 scattering matrix is presented for a subset of scattering angles (55 to 125 degrees), limited by the geometry of the experiment and the refractive effect of Snell's window. A rotating Fresnel rhomb and laser source is used to generate a known incident polarization state, while a spectropolarimeter acquires measurements of polarized radiance (including circular). The scattering matrix is inverted from the measurements in a least-squares sense using polarimetric data reduction techniques. Measurements of the near-forward scattering phase function (0-10 degrees) are acquired using a LISST-100X particle size analyzer and are integrated into the results. Matrices are presented for two wavelengths, 406nm and 633nm, and spectral differences are compared and contrasted. Validation of the results is achieved through measurement of suspended spherical particulates with known microphysics, and comparison with Mie scattering theory.

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