

OCEAN OPTICS XXIV

Valamar Lacroma Dubrovnik Hotel | Dubrovnik, Croatia | October 7–12, 2018

<https://oceanopticsconference.org>

Wednesday, October 10

Poster Session 3

16:00–18:00

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Poster 31

HYPERSPECTRAL POLARIMETRIC IMAGING OF THE OCEAN SURFACE

Hyperspectral imaging of the ocean is usually carried out by sensors on moving platforms, aircrafts or satellites, and is associated with scanning procedures for the acquisition of 3-D data cubes (along-track, cross-track and spectral). We present a state-of-the-art snapshot hyperspectral imager which simultaneously acquires spectra with 4nm spectral resolution in the wavelength range of 450-950nm with a 40 degrees field-of-view (FOV). The imager does not require any along track movement and allows for the continuous collection of data from stationary structures or slow moving platforms such as ships or helicopters. In addition, a computer controlled filter wheel installed in front of the imager allows for division-of-time Stokes vector image acquisition of the ocean surface. Results are presented from several sets of measurements from ocean platforms in the NYC area, Duck, NC and from shipborne observations along the Florida coast. Measurements made by the imager are compared with simulations using a vector radiative transfer (VRT) code showing good agreement. Analysis of pixel-to-pixel variability of the total above water radiance (L_t), sky radiance (L_s) and derived water-leaving radiance (L_w) for the viewing angles of 20-60 degrees in different wind conditions led to the estimation of possible errors in measurements of these radiances in un-polarized and polarized modes for the whole spectral range. The coefficient for skylight reflectance from the ocean surface is retrieved from these measurements; variation of the coefficient is assessed as a function of viewing angles and wavelength under various water and atmospheric conditions and compared with VRT simulated values.

Carlos Carrizo, The City College of New York - Optical Remote Sensing Lab, ccarriz00@citymail.cuny.edu,

<https://orcid.org/0000-0002-4281-8551>

Andrii Golovin, The City College of New York - Optical Remote Sensing Lab, agolovin@ccny.cuny.edu

Ahmed El-Habashi, The City College of New York - Optical Remote Sensing Lab, ahmed.elhabashi@gmail.com

Robert Foster, Naval Research Laboratory, robert.foster.ctr@nrl.navy.mil

Alexander Gilerson, The City College of New York - Optical Remote Sensing Lab, gilerson@ccny.cuny.edu