Friday, October 12
Oral Session 10
09:00–10:00

09:00–09:20

POLARIMETRIC RETRIEVALS OF THE REFRACTIVE INDEX OF THE OCEAN SURFACE

A novel and straightforward technique is presented, which allows retrieving the refractive index of the top microlayer of water bodies from polarimetric measurements. The method exploits observations of the NASA GISS airborne Research Scanning Polarimeter in the sunglint region, where the radiance at any given viewing geometry is dominated by the signal originating from the small range of wave slopes oriented precisely to cause specular reflection. Within the glint, the Degree of Linear Polarization is therefore independent on the windspeed and is determined analytically by the Fresnel law as a direct function of the refractive index. A further advantage is linked to the observational wavelength of 2.2 μm, which guarantees the minimization of aerosol interference and therefore the need of an atmospheric correction. The analyzed data were collected during recent field missions, from both low-altitude (B200/UC-12B) and high-altitude (ER2) aircraft. Stable retrievals from flight transects above pure seawater yielded values of refractive index that match closely the values published in the literature. In one case, the aircraft overflew the oil spill caused by the explosion of the Deepwater Horizon offshore platform and detected variations compatible with the presence of an oil slick. The solidity of the presented results, guaranteed by the high polarimetric accuracy of RSP-like sensors, opens the possibility for remote-sensing of other factors or species that similarly affect the refractive index of the top layer of the water surface, including foam/whitecaps, microplastic, seaweed and grass mats.

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