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Thursday, October 11
Poster Session 4
10:30–12:00

Poster 96

THE POTENTIAL FOR OCEAN REMOTE SENSING WITH SPACEBORNE HIGH SPECTRAL RESOLUTION LIDAR

The CALIOP lidar, operating since 2006 on the CALIPSO satellite, has demonstrated that spaceborne lidar has the sensitivity to provide scientifically valuable ocean data products. These products include a fundamental optical property, the particulate backscatter coefficient, and two key carbon cycle stocks, phytoplankton biomass and particulate organic carbon. Because lidar provides information regardless of sun angle and through gaps between clouds, it is a natural complement to ocean color and often provides sampling in regions and times of the year beyond the capability of passive sensors. CALIOP is a standard backscatter lidar and was not designed for ocean measurements. Its coarse vertical resolution limits ocean retrievals to surface-weighted column estimates rather than providing depth resolved information. Since 2012, a high-vertical-resolution airborne lidar employing the high-spectral-resolution lidar (HSRL) technique has demonstrated the value of this more advanced approach for providing depth-resolved profiles of key optical properties (particulate backscatter coefficient and attenuation coefficient) from which higher-order science products can be derived. The approach is being considered for the future satellite observing system defined in the US 2017 Decadal Survey for Earth Science and Applications from Space. We will present example ocean retrievals from airborne HSRL and simulations of the resolution and precision achievable from various space configurations. We also explore the lidar science value as a function of capability, with CALIOP at one end of the spectrum and a multi-wavelength HSRL with laser-excited chlorophyll fluorescence sensitivity at the other end.

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