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Thursday, October 11

Poster Session 4

10:30–12:00

Poster 239

CHARACTERIZATION OF BIO-OPTICAL ANOMALIES IN THE KERGUELEN AREA, SOUTHERN OCEAN, FROM SHIP-BASED SAMPLING AND BGC-ARGO PROFILING FLOATS

In spite of its major role in regulating the global carbon cycle, the Southern Ocean remains largely unknown due to a large surface area, remoteness from lands and harsh weather conditions yearlong. Satellite remote sensing of ocean color stands as a powerful tool for gaining insights into the dynamics of phytoplankton biomass and associated carbon fluxes. Yet, the Southern Ocean shows bio-optical anomalies that induce large uncertainties in ocean color-based biogeochemical products. Our objective is threefold: (1) to collect concurrent in situ optical and biogeochemical measurements in a drastically under-sampled region; (2) to characterize the origins of the bio-optical anomalies; (3) to examine the space-time variations in the anomalies. The SOCLIM (Southern Ocean and CLIMate) cruise was conducted in October 2016, in the vicinity of Kerguelen Islands in the Indian Sector of the Southern Ocean. The collected SOCLIM data show a substantial deviation in the relationship between phytoplankton absorption and chlorophyll a concentration compared to data collected in other open ocean waters. This trend is especially pronounced in the iron-fertilized waters downstream of Kerguelen and may result from a dominant contribution to the phytoplankton assemblage of large-sized cells and/or cells with atypical photophysiological status. In contrast, the bio-optical relationships involving either absorption by colored dissolved organic matter or particulate backscattering do not show any anomalous behavior. The shipborne observations are confronted to bio-optical indices measured by BGC-Argo floats deployed during SOCLIM for determining the regional and seasonal variability in the bio-optical anomalies.

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