

OCEAN OPTICS XXIV

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Thursday, October 11

Poster Session 4

10:30–12:00

Poster 40

BIO-OPTICAL CHARACTERIZATION OF THE NORTHERN ANTARCTIC PENINSULA WATERS: ABSORPTION BUDGET AND INSIGHTS ON PARTICULATE BACKSCATTERING

A comprehensive set of bio-optical properties is presented for the northern Antarctic Peninsula in the Southern Ocean. The relative contributions of phytoplankton, colored dissolved organic matter (cdom) and detritus to light absorption highlight the importance of phytoplankton, but cdom is often significant in the blue range of the spectra, despite its roughly constant values at 443nm in contrast with the three orders of magnitude of total chlorophyll-a concentration, [TChl a], ($0.019\text{--}2.91\text{mgm}^{-3}$) observed in the upper 100m. The particulate backscattering coefficient, $b_{bp}(\lambda)$, was remarkably low if compared to other oceanic waters, but agrees with previous studies in the Southern Ocean. Even with very low absorption, detritus was the component better correlated with particulate backscattering in the Antarctic Peninsula, while phytoplankton cells (dominant in the particles pool) mostly covaried with particulate scattering. Particulate backscattering ratios ($bbp(\lambda)$ divided by the particulate scattering coefficient, $bp(\lambda)$) were also below values observed in other oceanic waters. The spectral diffuse attenuation coefficient, $K_d(\lambda)$, was highly correlated to [TChl a] ($R^2=0.90$ at 443nm) and showed no dependence on $bbp(\lambda)$. Indeed, $K_d(443)$ and non-water absorption coefficients at 443nm were related by a 1 to 1 dependence. The shape of the spectral remote sensing reflectance varied little responding mainly to variability in [TChl a], while [TChl a] vs. maximum band ratios dependence deviated from global trends in a very similar fashion as in other studies of the Southern Ocean, likely due to very low $bbp(\lambda)$.

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