Garcia, V.M.T., Garcia, C.A.E., Mata, M.M., Sousa, E.M. e Pollery, R. (2005). High phytoplankton biomass along the Patagonian Shelf-break. XIII Simpósio Brasileiro sobre Pesquisa Antártica, São Paulo, 28-30 de Setembro. Programa e Resumos, pp 81-82.

The Patagonian shelf off Argentina shows complex dynamic processes influenced by tides, the confluence of Brazil and Malvinas Currents, and the transition zone between the shelf water of various origins and the Malvinas Current (MC) water. In the shelf-break, the cooler and saline waters of the MC meet the subantarctic shelf waters, producing a distinct oceanographic front. Along the shelf-break front, consistent streaks of high chlorophyll are observed during austral spring and summer. In ocean color images these patches can show high blue reflectance, characteristic of coccolithophore blooms, which can occupy an area over 500,000 Km^2 (Brown and Podesta, Remote Sens. Environ., 60: 83-91, 1997). A time series analysis of SeaWiFS chlorophyll images (OC4v4 alogorithm) has shown that the high chlorophyll signal presents an annual cycle and persists from October to March (Garcia et al, Deep-Sea Res., 51, 159-172, 2004). However, no samples have been previously collected contemporaneously with satellite image data to validate specific algorithms for this region. Furthermore, no systematic studies have been conducted to determine the *in situ* phytoplankton abundance and to investigate the factors that control the blooms over the austral spring and summer.

The PATagonia EXperiment (PATEX) was specially designed (1) to investigate the environmental factors that control the occurrence of these blooms; (2) to characterize the phytoplankton assemblage and primary production rates; (3) to determine the main nutrient levels and ratios associated with the bloom waters; and (4) to determine their bio-optical characteristics. Here we present preliminary results on phytoplankton biomass distribution (chlorophyll-a) along the shelf-break and its relationship with some optical parameters.

Nineteen oceanographic stations were sampled in the Patagonian shelf-break from 3-6 November, 2004. Sampling was conducted during daytime, in groups of 4 or 5 stations, with the ship moving southwards during the night. Vertical profiles of temperature, salinity, dissolved oxygen, chlorophyll fluorescence (Seapoint) and light backscattering (WET Labs Eco Triplet) were taken with a SeaBird 911+ Carrousel system. In addition, measurements of spectral water leaving radiance and surface irradiance were conducted with a Satlantic radiometric buoy. Water was sampled in the upper 200 m by the 5-liter

Niskin bottles for laboratory analysis of plankton and nutrients.

Water column integrated chlorophyll-a was considerably high, varying between 90.4 and 1073 mg m^{-2}, with a mean value of 627 mg m^{-2}. Two stations sampled east of the high chlorophyll band showed much lower integrated chlrophyll values, associated with high concentration of inorganic Nitrogen, indicating low N uptake rates outsite the patch.

Measurements of spectral water leaving radiance and surface spectral irradiance have been used to compute the spectral remote sensing reflectance (Rrs). The ratios Rrs443/Rrs555, Rrs490/Rrs555 and Rrs510/Rrs555 were calculated for 18 stations and applied to the OC4v4 algorithm. The relationship between *in-situ* and algorithm derived-chlorophyll concentrations indicate that the global OC4v4 algorithm represented very well the surface chlorophyll levels over the range studied in November 2004 (Figure 1).

A preliminary analysis of the phytoplankton samples showed a predominance of diatoms and large dinoflagellates in the high chlorophyll band during the study period, indicating that a succession to coccolithophorids dominance may not take place before summer. This has an important implication in terms of carbon removal from the ocean surface layer, since large cells of mineral ballast organisms (silica diatom shells) sink faster than smaller and lighter organisms.

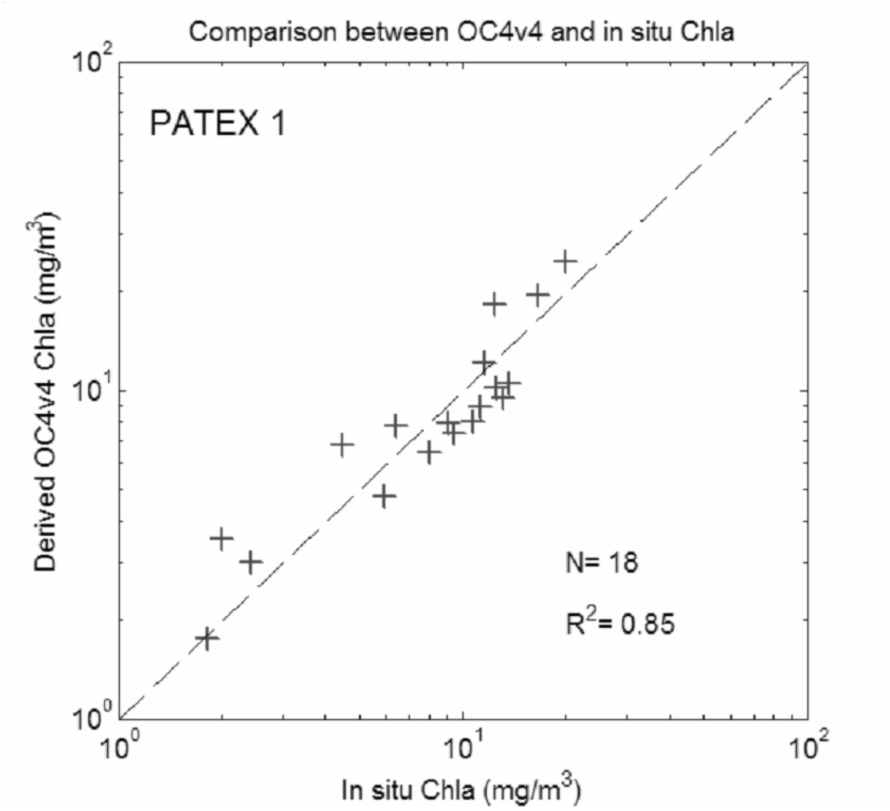

Figure 1. Comparison between OC4v4 derived-chlorophyll using spectral reflectance measured at sea and *in situ* chlorophyll-a at 18 stations during PATEX I cruise.

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