



Distribution of total dissolvable iron during the natural iron fertilisation experiment KEOPS (Kerguelen Island, Southern Ocean)

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During KEOPS (Kerguelen Ocean and Plateau compared Study, Jan.-Feb. 2005), the distribution of total dissolvable Fe (unfiltered samples, TDFe) was investigated in the water column above the Kerguelen plateau, where a massive bloom occurs yearly, and in the surrounding HNLC area. Three transects were realised across these two contrasting environments. Samples were stored at room temperature and analysed 18 months later by flow injection analysis with chemiluminescence detection. The mean blank was equal to 0.05 ± 0.04 nM (n=15) and the detection limit 0.02 ± 0.01 nM (n=15). At station C1, located closed to Heard Island, very high values of TDFe were observed in the whole water column (concentrations ranged from 328,60 to 770,20 nM), probably due to the hydrothermal activity in the vicinity if this Island. Except for this station, above 150m, TDFe concentrations ranged from 0.66 to 5.02 nM (mean value 2.45 ± 1.15 nM, n= 27) for the stations above the plateau and from 0.34 to 1.00 nM (mean value 0.75 ± 0.33 nM, n=5) for the stations outside the plateau. Below 150 m, TDFe concentrations for the stations above the plateau varied between 1.16 and 18.42 nM (mean value 5.48 ± 4.75 nM, n=25) and between 0.39 to 2.22 nM (mean value 1.06 ± 0.65 nM, n= 12) for the stations outside the plateau. Higher values of TDFe above the plateau confirmed the potential source of iron from the plateau, also evidenced by dissolved Fe ($< 0.2 \mu\text{m}$, DFe) concentrations measured on board. The apparent particulate Fe ($\text{Fe}_{app} = \text{TDFe} - \text{DFe}$) ranged from 0.52 nM to 9.80 nM for stations above the plateau (the mean value 2.88 ± 1.77 nM, n=43, represented $93.4 \pm 5.3\%$ of TDFe) and from 0.05 nM to 0.80 nM (the mean value 0.47 ± 0.27 nM, n=9, represented $57,42 \pm 24.19\%$ of TDFe) for stations outside the plateau, and

suggested that a significant amount of refractory colloids was released after several months of acidification.