Iron isotopes along the Equator in the western and central Pacific Ocean

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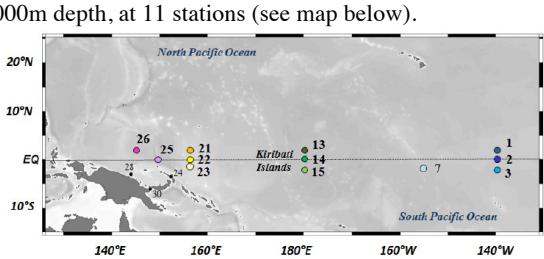
As an essential micronutrient, and also because its oxides efficiently scavenge many trace elements, iron (Fe) plays a key role in oceanic biogeochemical cycles. The relative importance of its various sources to the ocean, the processes involved in the release of dissolved (DFe) in seawater and the interactions between its dissolved and particulate pools are still largely unknown. Several recent studies have shown that Fe isotopes bring unique new insights into these questions.

We obtained iron isotope data from the Equatorial Pacific (EUCFe cruise, 2006), from the western boundary to 140°W in the Central Pacific, for aerosols, filtered seawater (<0.4μm) and suspended particles (>0.4μm), from the surface down to 1000m depth, at 11 stations (see map below).



Aerosols display slightly heavy isotopic signatures, which will be briefly discussed. While the impact of continental inputs on the Fe isotope water mass signatures in the Papua New Guinea area has been discussed in another study [1], we will focus here on the open ocean. Comparison of filtered seawater signature with that of the suspended matter at the depth of the chlorophyll maxima suggest a possible isotopic fractionation associated with DFe uptake by phytoplankton. Our data suggest a preferential uptake of light iron isotopes in this area, in agreement with previous works [2]. At depth, potential links with dissolved O_2 concentration and organic matter remineralization will be discussed.

[1] Labatut et al. (2014) *Global Biogeochem. Cy.* **28**, doi:10.1002/2014GB004928. [2] Ellwood et al. (2015). *Proc. Natl. Acad. Sci.* **112**, E15–E20.