INSIGHT INTO CONTRIBUTIONS OF DIFFERENT IRON SOURCES TO THE OCEAN FROM A MODEL OF THE STABLE ISOTOPES OF IRON

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It has been widely accepted that iron is an essential micronutrient for ocean biota, and its distribution strongly affects the magnitude of phytoplankton primary productivity and thus the carbon uptake in the ocean. Yet there is still no consensus on the mechanisms behind the distribution of iron and especially on the relative role of different external iron sources to the ocean (e.g. aeolian dust, marine sediments, hydrothermal and riverine inputs). In recent years, the analysis of the stable isotopic composition of dissolved iron in sea water has been increasingly used to constrain the relative role of different iron sources. To take into account processes in the ocean interior to frantionate between iron isotopes and physical processes (transport and diffusion) to mix water masses with different isotopic compositions, we have extended a global biogeochemical model of iron with an explicit representation of isotopic effects and present here some insight from the modelling perspective into contributions of differrent iron sources to the ocean.