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New sedimentary ^{231}Pa/^{230}Th and benthic stable isotopes records suggest AMOC changes prior to MIS3 Heinrich Events.

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The region of the North Eastern Brazilian margin is of major interest in the study of the variability of the oceanic circulation because of the large part of the Atlantic Meridonal Overturning Circulation (AMOC) passing through it.

In order to better understand the changes in the AMOC during Heinrich events, we chose to study two sediment cores at different water depths so that we may observe not only changes in the intensity of circulation of the water masses influencing the cores, but as well changes in the vertical extent of these water masses.

Heinrich Events are particularly well defined on the Brazilian margin. Indeed, they are associated with southward shifts of the Inter-Tropical Convergence Zone (ITCZ) that induce increased precipitations over our study site [1]. This causes higher terrigenous fluxes as revealed by marked Ti/Ca peaks in our marine sediment cores.

Due to the difference in particle reactivity of ^{231}Pa and ^{230}Th in the water column sedimentary ^{231}Pa/^{230}Th (Pa/Th) may be used to record changes in AMOC. In the case of the western equatorial Atlantic region, the sedimentary Pa/Th vertical profile measured on recent sediment is consistent with a dominant role of the AMOC, rather than particle scavenging, thereby demonstrating that Pa/Th can indeed be used to monitor changes in water mass overturning rates in that region [2]. Benthic foraminifer carbon isotopic ratio on the other hand has been widely used to assess changes in nutrient content of the water masses.

We present new measurements of sedimentary Pa/Th and foraminifer stable isotopes over Heinrich 2 and 4. These data combined with a robust ^{14}C-based age model, enable us to reconstruct the timing and extent of the AMOC changes related to these two Heinrich Events. We show that the AMOC went through depth dependent changes during Heinrich Events. Moreover, the good constraints on Heinrich Events timing brought by the Ti/Ca peaks and the ^{14}C age model allow us to assess the timing of the circulation changes with respect to Heinrich Events.

[1] Jaeschke (2007) Paleoceanography 22, PA4206. [2] Lippold (2011) Geophys. Res. Lett 38, L20603.