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Eastern Atlantic deep-water circulation inferred from neodymium and carbon isotopic compositions over the past 1200 thousand years

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Mid-Pleistocene transition (MPT; 1200 to 800 thousand years, ky) is marked by an intensification and a shift of glacial-interglacial cycle from 41 ky to 100 ky that is not directly supported by solar insolation. These changes can be explained by combined effects of the stabilization of ice sheets associated with regolith removal with atmospheric CO_2 reduction caused by active biological pumping in the Southern Ocean. Significant changes in ocean circulation was also suggested.
To improve the spatiotemporal coverage of past ocean circulation records, we analysed Nd isotopic ratios recorded in foraminiferal authigenic fractions and epibenthic foraminiferal stable isotopes on two cores: MD03-2705 (18°06'N, 21°09'W, 3085 m) in the eastern tropical Atlantic where the reconstruction based on Nd isotopes is absent for this timescale and ODP1085 (29°22'S, 13°59'E, 1713 m) that is located at the present boundary between a northern source water (NSW, North Atlantic Deep Water) and a southern source water (SSW, Antarctic Bottom Water).
Sequential cleaning and SEM observation of foraminiferal tests of MD03-2705 indicate that Nd isotopic ratios of authigenic phases reflect seawater values despite the fact that the core is located under Saharan dust plume. Reconstructed seawater Nd values of MD03-2705 ranges between -12.7 and -10.3 with more radiogenic values during glacial periods, suggesting an increase in SSW proportion. The glacial-interglacial eNd amplitude is smaller for the MPT than for the post-MPT. Epibenthic d13C values of ODP1085 varies from -0.6 to 0.9‰ with a clear positive shift at MIS 13 that is not observed for core MD03-2705. These results suggest the reorganisation of Atlantic meridional overturning circulation since the MPT. The analysis of eNd for core ODP1085 is in progress. We will discuss variability in relative proportion between SSW and NSW in relation to carbon cycle by combining reconstructed seawater eNd and d13C values from the two cores with available records.