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Temporal evolution of the Ethiopian monsoon intensity since the last 25,000 years from the Nile suspended discharges record.

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Previous researches (7 oceanographic cruises) on the Nile margin conducted since 1998, have provided a large data set, including detailed bathymetry maps (Mascle et al. 2006), HR seismic reflection profiles and numerous piston cores ($\sim$ 862 m length). The sedimentological analysis of more than 70 sediment cores allowed to define the different sedimentary facies (hemipelagites, turbidities, slumps, debris flows and sapropeles) and their spatio-temporal distributions on the entire Nile margin, since the last 200.000 years (Migeon et al. 2010; Garziglia et al., 2009; Ducassou et al., 2007, 2009). One important conclusion is that the Nile Deep Sea Fan are also strongly controlled by climatic-monsoon variability of the Nile catchment (Ducassou 2006 thesis, Ducassou et al. 2009).
Multi-proxy data set (micropaleontology, geochemistry, palynology) show that a continuous record of the Nile flood discharge can be obtained from the core MS27PT, located on the continental slope, closed to the Nile fluvial discharge (90 km outward of the Rosetta mouth of the Nile). It is thus possible to record with a great sensitivity the Nile fluvial detrital influence (Revel et al., 2010). In addition, Sr and Nd isotopes measurements allowed to i) show that sapropel deposition is only a short event within the time interval of monsoon intensification implying that sapropels are not an ideal record for precisely documenting the timing of the monsoon maxima (Caley et al. 2011), ii) identify the Ethiopian highland as the main detrital source in the Nile margin and imply that the Nd isotope variations can be interpreted as Ethiopian monsoon intensity fluctuation over the last 25 ka at high resolution (100 years during the early Holocene humid period). The detailed Fe record shows the Nabtian period from 14 to 8 ka cal BP attributed to strengthening of the African monsoon over Ethiopia. Pollen record from the same core highlights vegetation changes over the coastal neighboring area especially during the deglacial time and Holocene in correlation with humidity increase. From 14 to 8 kyr, recurrent inputs of fresh water algae in the sediment correlate with several Nile floods that punctuate the Ethiopian monsoon strengthening. Presence of tropical native taxa at the same time reinforce hypothesis of far inputs from tropics carried in deltaic sediment by the Nile river discharges.