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Sedimentary patterns on Cape Ghir margin (Morocco) during the past 30 kyr deciphered by their magnetic and geochemical properties

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The sediments deposited on the Cape Ghir margin (Morocco) contain detailed records of Holocene oceanic and climatic regimes. Based on these results, the newly designed drill-rig MeBO has retrieved two pushed-cores on the continental margin (R.V. Maria S. Merian, 2007): cores GeoB11804 (355 m water depth) and GeoB11807 (908 m water depth). Since this corer allows deeper penetration in the sequence, we can extent the paleo-record further back in time. Also, the sedimentation in this region is known to be greatly fed by aeolian dust which can be traced using the magnetic properties of sediments, and eventually compared to the upwelling activity.
A set of 26 calibrated ^{14}C ages show that core GeoB11804 covers the last 30 kyr. Correlation of magnetic susceptibility profiles and δ^{18}O measurements on planktonic foraminifers indicate that core GeoB11807 spans the last 20 kyr. Both cores exhibit mean sedimentation rates of $\sim$110 cm/ka, therefore providing a time resolution of $\sim$20 years.
Very low terrigenous and magnetic contents are recorded between 30 and 18 ka, indicating the predominance of marine input on the margin during the Last Glacial Maximum (25-20 ka). The deglaciation is marked by pulses of magnetite (Fe_3O_4) and greigite (Fe_3S_4) at 18 and 12 ka, probably related to rapid sea level rises. These pulses are superimposed on a steady increase in terrigenous and magnetic contents between 18 and 10 ka, which could indicate a progressively stronger terrigenous contribution (from winds or rivers) due to sea level rise and/or climatic change. The Younger Dryas event (YD, 12-11 ka) is here recorded as an abrupt decrease in terrigenous sediment delivery. The hematite (Fe_2S_3) and goethite (FeOOH) contents rapidly and step-wisely increase after the YD and stabilize at $\sim$ 8 ka. At $\sim$ 1.7 ka, the magnetic contents abruptly increase, which might be related to diagenetic processes around the Sulfate-Methane transition. The top 1500 yrs are enriched in magnetic minerals of rather low grain-size in both cores, that might constitute the pristine present-day sedimentary assemblage. Further work is needed to elucidate the sedimentary changes occurring during the Holocene, and particularly at times of drastic changes in the Saharian environment (e.g. the African Humid Period).