ROCK-MAGNETIC PARAMETERS OF SEDIMENT FRACTIONS OBTAINED FROM GRAVITY CORES DRILLED OFF NW AFRICA

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This study investigates rock-magnetic proxies of sieved sediment fractions to determine source regions and eolian transport. Grain-size selectivity of early diagenetic magnetite dissolution was also subject of the investigation.
The examined marine sediment from Late Quaternary was obtained from 11 gravity cores recovered perpendicularly to the coast of Senegal. From each core 2 time slices (Heinrich Event 1: 15 ka BP and Mid-Holocene: 6 ka BP) were examined.
The sediment was devided into 16 fractions by wet sieving (500 - 20 μm) and settling method (14 - 2 μm). Magnetic susceptibility (κ), anhysteretic remanent magnetization (ARM) and isothermal remanent magnetization (IRM) of each fraction were measured.
Grain-size distribution along both profiles showed a fining with off-shore distance. This sorting is due to eolian transport (Trade Winds and overlying Harmattan). Additionally, within Mid-Holocene the sediment is finer than in Heinrich Event 1 due to weaker winds and a more dominant fluviatile input.
The Fe-oxide content is distinctly higher in the finer fractions (< 20 μm). The stronger magnetic signal within the southern profile B is due to more tropical conditions and a higher fluviatile input. The temporal differences between the two time periods are caused by stronger winds during aride conditions within Heinrich Event 1 and therefore by a higher eolian input of Fe-oxide crusted quartz grains from the Sahel Zone.
The ARM/IRM ratio over the grain-size fractions seems to be a robust parameter for grain-size identification. This ratio increases between 20 and 2 μm due to an increasing influence of pseudo-single-domain (PSD) grains of magnetite (exhibited by ARM). From 20 to 500 μm the ratio increases again due to heavily decreasing IRM. A reductive dissolution milieu could be defined by an anomalous trend of this ratio at water depths between 450 - 800 m within Mid-Holocene.

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