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Partial Chemical Remagnetization of Sediments from the Equatorial Pacific off the Coast of Peru

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The study of the geomagnetic field in the past is made through the fossil magnetization recorded in geological and archeological materials. In sediments the magnetization is acquired during or after deposition (pós-depositional remanent magnetization - pDRM), and the dating of geomagnetic features recorded in this materials depends on the time between deposition and magnetization lock-in and the depth in which the magnetization is mechanically blocked (e.g. Tauxe et al, 2006). Besides these processes, diagenesis (e.g. sulfate reduction) can compromise the paleomagnetic record in sedimentary sequences. Marine sediments are exposed to many different chemical environments which can drive the formation of new magnetic minerals. In presence of H2S, magnetite can be dissolved and iron sulphides be formed, such as greigite a precursor of pyrite in anoxic sulfate-reducing sedimentary environment (Roberts & Weaver, 2005; Rowan et al, 2009; Roberts et al, 2011). The age of magnetization in sediments affected by chemical magnetization (CRM) is much harder to be stablished. Here we performed a detailed magnetic characterization using 'environmagnetic' parameters (χ, ARM, IRM, S-Ratio, HIRM, ARM%) and hysteresis curves for sediments from the equatorial Pacific which were deposited in a strong redox gradient, from oxic to anoxic conditions in the water column. Magnetic mineralogy and SEM images show both authigenic iron sulphide (greigite) and detrital iron oxide (magnetite) all across the core, suggesting that reducing conditions prevailed in pore waters all along the sedimentation history. Scattering in directions are usually associated to intensely altered intervals, where greigite is the dominant magnetic carrier. Yet, besides the presence of greigite all through the analysed cores it is still possible to obtain a reliable geomagnetic field record from most samples after classical paleomagnetic treatment.