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Geomagnetic field inclination and paleointensity variations recorded by the late Pleistocene reef sequence of Tahiti: contribution to the chronology of the deposits.

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The scientific objectives of the IODP 310 Expedition were to reconstruct sea-level and paleoclimatic changes and the evolution of the Tahiti fossil reef system during the late Pleistocene and Holocene through a multidisciplinary approach. Rockmagnetic and paleomagnetic approaches can contribute to achieve those objectives both by providing proxies of the terrigeneous fluxes to the reef and by establishing a magnetostratigraphic sequence based on the nature, direction and intensity of the magnetization. Completing radiometric dating (^{14}C or U series), series of magnetostratigraphic markers such as geomagnetic paleointensity lows and geomagnetic excursions -known to have occurred during the end of the Brunhes normal polarity epoch (780 ka BP) - provide robust chronological constraints. Along the 79m-thick pleistocene reef sequence collected in the Maraa area (S-W of the Tahiti-Nui Island), paleomagnetic specimens were drilled in all consolidated facies. Magnetic susceptibility, Natural Remanent Magnetization, Anhysteretic and Isothermal remanent magnetization measurements reveal that a mixture of single-domain, pseudo-single domain and multidomain grains of titano-magnetite is the main magnetic carrier. NRM inclination values compatible with the dipole field direction demonstrate that this material reliably recorded the geomagnetic paleosecular variation. Series of reversed inclinations

and low relative paleointensities are however recorded in few stratigraphical subunits. These have been correlated with known geomagnetic excursions based on the availability of a few radiometric ages: part of the Blake event (115-120 kyr BP) is therefore identified between 103 and 119 m b.p.s.l, otherwise constrained by an age of $\sim$134 ka BP at $\sim$117 m. With subsidence rates ranging from 0.25 to 0.5 mm/yr, these reef deposits can be attributed to the marine isotope stage (MIS) transition 5/6 and to the MIS 5. Between 140 and 156 m b.p.s.l, the thick sequence including reef frameworks also records low relative paleointensities and directional instabilities including another geomagnetic excursion. This reef unit could have been deposited during a sea level highstand, possibly during stage 9, or earlier depending on different scenarios of subsidence rates. The relative paleointensity record also enables the identification of two other lowstand reef units, in agreement with sedimentologic data.