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Continuous record of the last 30 ka of Paleosecular Variation in a turbiditic marine sedimentary sequence off the NW Iberian Margin

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Past variations of the geomagnetic field at decadal to centennial scales are recorded with exceptional quality in lava flows, but these are discontinuous and therefore high temporal resolution analyses of paleosecular variation of the geomagnetic field (PSV) are difficult. For such purposes, marine sediments hold a better potential since they are often regarded as continuous sedimentary archives of a range of environmental processes, in particular PSV. While this assumption is generally valid for the deep abyss, it may not be necessarily true for marginal settings and the vicinity of seamounts, where discontinuous sedimentary flows (e.g. turbidites) occur with a relatively high frequency.

In this contribution, we present results from two gravity cores (TG8 and TG10) obtained from the flanks of the Galicia Bank, a structural high in the NW Iberian Margin. These cores are mostly comprised of a turbiditic sequence, with continuous pelagic sedimentation recorded continuously over the last 16 ka. Contrary to what would be expected, Alternating Field demagnetization of the NRM showed a PSV record consistent with the behaviour of the geomagnetic field in this region, which could be correlated with a published record in the adjacent Portuguese Margin (Thouveny et al., 2004). These results show that even in a unstable marine sedimentary setting, affected by discontinuous mass flows and biological activity, the delayed and gradual lock-in of the magnetization allows for a continuous record of the geomagnetic field.

References:

Thouveny, N., Carcaillet, J., Moreno, E., Leduc, G., Nérini, D., 2004. Geomagnetic moment variation and paleomagnetic excursions since 400 kyr BP: a stacked record from sedimentary sequences of the Portuguese Margin. Earth and Planetary Science Letters 219, 377-396.