
Geomagnetic field intensity changes in western Europe during the last millennia: new archeointensity data from Spanish potteries

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Résumé

Over the last years new evidences of several intensity, short-lived, regional maxima of geomagnetic field intensity at various times and locations have been obtained. However, these features are not precisely described due to the limited number of high-quality archeointensity data. One of the main difficulties to obtain such a high-resolution reconstruction is the scarcity of precisely dated heated archeological materials. In this context, pottery fragments from superimposed strata covering long sequences of occupation provide a powerful tool to recover a clearer sequence of geomagnetic field intensity changes in the past. In this work we report the archeomagnetic study of several groups of ceramic fragments from southeastern Spain that belong to 14 stratigraphic levels corresponding to a surface no bigger than 3 m by 7 m. The ages of the pottery fragments studied range from the 8th to the 11th centuries. The dates were established by three radiocarbon dates and by detailed archeological/historical constraints including typological comparisons and very well-controlled stratigraphic constraints. From classical Thellier and Thellier experiments including pTRM checks and TRM anisotropy and cooling rate corrections, height new high-quality mean intensities have been obtained. The new data obtained provide an improved description of the sharp abrupt intensity changes that took place in western Europe around 800 AD, one of the main geomagnetic features observed in Europe during the last millennia. Together with a selection of high-quality data for the last 2000 years, the new results confirm that several rapid intensity changes (of at least 10 $\mu\text{T}/\text{century}$) took place in western Europe during the recent history of the Earth.

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