

New full geomagnetic field vector data from Italy: Evidence of low intensity values during Neolithic times.

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We present new, full geomagnetic field vector results from three Neolithic ovens discovered at the archaeological site of Portonovo (Marche, Italy). The ovens were built by digging a kind of small cavities into the colluvial layer and represent a rare example of very well preserved underground ovens from the Early Neolithic period. Standard thermal demagnetization procedures were used to isolate the Characteristic Remanent Magnetization. The obtained directions are well defined with small α_{95} angles of confidence and are very similar with each other. The corresponding archaeointensities were determined by the multi-specimen procedure (MSP-DSC). Successful archaeointensity determinations were obtained for two of the three studied ovens giving intensity values around $28 \pm 1 \mu\text{T}$. The clear, well defined, low intensity values obtained suggest that the intensity of the Earth's magnetic field around 5500 BC was almost $20 \mu\text{T}$ lower than today's field in Italy. Such low intensity seems to be an interesting feature of the geomagnetic field in Neolithic period and it is worth of being further investigated by obtaining new data for Europe from the same chronological period.

The new results are the first contribution of full geomagnetic field vector data for Neolithic in Italy. They are compared with other contemporaneous data from Europe and with global geomagnetic field models. Independent archaeomagnetic dating of the three ovens was also performed by means of the SCHA.DIF.8k model. The obtained results are in good agreement with available radiocarbon dates and confirm that all ovens belong to the Neolithic period and were almost contemporaneously used. These new data importantly enrich our knowledge of the geomagnetic field during the Neolithic period that is poorly covered by data, not only in Italy but also in the whole Europe and show that archaeomagnetic dating can provide precise results even for prehistoric periods.