

# **Post-fire displacement of ancient bricks and its effect on the geomagnetic field vector determination: A case study from a Roman kiln excavated at Dispilio, Greece**

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Archaeomagnetic analysis was carried out on ancient bricks collected from a Roman kiln excavated at the locality of Dispilio, Kastoria, Northern Greece. A total of 11 brick samples were collected from different parts of the kiln, all of them oriented *in situ* with a magnetic compass and an inclinometer. Rock magnetic analysis identified the presence of magnetite together with a high coercivity magnetic carrier, most probably hematite. Both thermal and alternative field (AF) demagnetization procedures were applied to isolate the direction of the geomagnetic field vector registered by the bricks during their last firing.

The results show a very stable and well defined magnetic component, with excellent agreement between the thermal and AF determinations. Nevertheless, equal area plots of the Characteristic Remanent Magnetization at sample level show important dispersion, indicating a clear post-firing displacement of the bricks coming from the kiln's walls, while the bricks from the central pillar show very consistent directions. The mean archaeomagnetic direction calculated based only on the bricks with no displacement evidence was used for the archaeomagnetic dating of the kiln. The obtained dating is in very good agreement with available thermoluminescence analysis and the new directional data can be used as reference points for the Greek directional secular variation curve.