Archaeomagnetic Study of a Lime Kiln at Bazzano (Northern Italy) and Age Estimation using the Bayesian Approach

E. Tema (1), R. Lanza (1) and Ph. Lanos (2)

(1) Dipartimento di Scienze della Terra, Università degli Studi di Torino, Torino, Italy, (2) CNRS, Université de Rennes, Rennes, France (evdokia.tema@unito.it)

Archaeomagnetic study was carried out on bricks sampled from a circular lime kiln at Bazzano, near to Bologna (Northern Italy). The structure sampled is under threat to be destroyed as it is situated inside an open quarry for gravel exploitation. Based on very poor archaeological information the kiln is dated around 3rd -4th century AD but no other structures have been excavated in the area to support this age.

Hierarchical sampling process has been followed, collecting 12 independently oriented samples in situ from which 32 cylindrical specimens have been finally obtained and measured. Stepwise thermal and AF demagnetization shows no or negligible secondary magnetization components and a very stable characteristic remanent magnetization (ChRM). Investigation of isothermal remanence points to magnetite as the main carrier of magnetization, together with a minor medium-coercivity mineral. The dispersion of the mean direction of the 12 studied samples is very low.

An archaeomagnetic age is given to the structure using the Bayesian statistical approach and the French secular variation curve. The Italian archaeomagnetic database has been also elaborated using the Bayesian stochastic approach for curve building and the preliminary Italian secular variation curve obtained has been subsequently used to date the given structure. Results from the two curves have been compared and combined with archaeological evidence.