



## **Developing a global geomagnetic field model for archaeomagnetic dating in Europe for the last 2000 years (updating GMADE2K.1 to GMADE2K.2)**

**A. Lodge** and R. Holme

Department of Earth and Ocean Sciences, University of Liverpool, Liverpool, L69 3GP, UK

In a recent paper (Lodge & Holme, 2008), we introduced the model GMADE2K.1 (Global Model for Archaeomagnetic Dating in Europe for the last 2000 years, version 1). This model was developed using the currently available Bayesian secular variation curves for Europe as data and CALS7K.2 (Korte & Constable, 2005) as an a priori model. By relaxing the smoothness constraints on the model, we fit the data better than CALS7K.2. Significantly, we show that the curves currently used for dating are not mutually consistent, and therefore that not only is this method viable, but in the future it will provide more reliable curves for archaeomagnetic dating. Here we present the next stage of development of the model, which contains all the data from the CALS7K.2 database (Korte et al., 2005), along with all the new data published since then, largely as part of the AARCH network project. GMADE2K.1 included directional input data only, with intensity control through CALS7K.2. The development of the model presented here contains both directional and intensity data as input. Comparisons will be made between GMADE2K.1, CALS7K.2 and the new model, GMADE2K.2. Furthermore, with the addition of intensity data, we consider whether GMADE2K.2 can be used to study the recently proposed link between the centennial secular variation of the geomagnetic field and climate change, through the observation of archaeomagnetic jerks.

### References:

Korte, M., Constable, C.G., 2005. Continuous geomagnetic field models for the past 7 millennia: 2. CALS7K, *Geochem. Geophys. Geosys.* 6, Q02H16.

Korte, M., Genevey, A., Constable, C. G., Frank, U., and Schnepp, E., 2005, Continuous geomagnetic field models for the past 7 millennia: 1. A new global data compilation, *Geochem. Geophys. Geosys.* 6, Q02H15.

Lodge, A., Holme, R., 2008, Towards a new approach to archaeomagnetic dating in Europe using geomagnetic field modelling, *Archaeometry* (accepted).