



Full vector archaeomagnetic data and Bayesian modelling for 1300 to 1750 AD

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The data base of geomagnetic palaeointensities obtained from archaeological artefacts is poor and very scattered for Western and Central Europe. High precision palaeointensities have been determined from a single archaeological site in Lübeck (Germany) where a sequence of 25 bread-oven-floors has been preserved in a bakery from medieval times until today. Age dating confines the time interval from about 1300 AD to about 1750 AD. Palaeomagnetic directions have been determined from each oven-floor (Schnepp et al., JGR, 2003). Palaeointensity was measured from selected specimens with the double-heating Thellier method and reliable palaeointensity results have been obtained. Tests for thermoremanent magnetisation anisotropy have been performed, but did not show a significant change, while a cooling rate correction was not necessary. 22 mean palaeointensity values derived from the oven-floors show maxima in the 15th and early 17th century AD, followed by a decrease of palaeointensity of about 25% until 1750 AD. The Thellier experiments provided also new characteristic remanent magnetisation directions which were included in the data set. Mean directions have been recalculated. Palaeointensity together with the directions represent a record of about 450 years full vector secular variation. From this full vector data set a secular variation curve has been calculated using a Bayesian modelling taking dating errors, all errors on the field vector and stratigraphy into account. A smooth curve with an error envelope was obtained which compares very well with the gufm1 geomagnetic model (Jackson et al., Phil. Trans. R. Soc. Lond. A, 2000) obtained from historical observations starting at 1600 AD. Comparison of the marginal curve obtained for palaeointensity with a selected data set of archaeomagnetic intensities from Western and Central Europe will be discussed.