Geophysical Research Abstracts
Vol. 14, EGU2012-8050-2, 2012
EGU General Assembly 2012

Problems in archaeomagnetic reference curves elaboration in the prehistoric past.

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Most important task of archaeomagnetic studies is the construction of the geomagnetic field secular variations in the past for a given territory. The obtained reference curves would be precise only when a large number of well-dated archaeological sites from different time periods are included as input data. Sofia Palaeomagnetic laboratory is the first one in the Balkans to accumulate a large number of data spanning the time interval of 3000 BP to 8000 BP. Many archaeological sites in Bulgaria are multilevel settlements with clear stratigraphy. Commonly the prehistoric sites are dated according to the relative chronology, the type of archaeological artifacts found and 14C dates, the latter being not always available. The biggest difficulty is that usually the radiocarbon dates are not well constrained, often contradictory to the vertical stratigraphy. The transformation of conventional 14C dates to absolute dates BC depends a lot on which part of dendrochronological calibration curve are they related. Besides, multiple dating intervals are often obtained and the calibrated intervals are usually very large (from 100 to 300 and more years).

However, when archaeological discoveries of multilevel prehistoric sites are combined with archaeomagnetic investigations the corresponding archaeomagnetic profiles can be obtained. Currently we have archaeomagnetic data for fifteen prehistoric multilevel sites – two of them are Neolithic, nine – Eneolithic and four are from the Bronze Age. The next step is to juxtapose these stratigraphic profiles with the absolute scale of time having in mind that not all sites and layers have 14C dates. Thanks to abundance of 14C dates for most of Bulgarian prehistoric sites, multilayer sites connected with the absolute chronology exist and can be used as reference profiles. The time frames of each horizon for such reference site are based on series of 14C dates (not single measurements), the analysis of the thickness of layers, type of material dated (perennial or annual) and cultural features. An example for such reference profile is the multilevel site Yunatzite from the Early Bronze Age. The comparison of archaeomagnetic profile Yunatzite with another archaeomagnetically studied Early Bronze Age multilevel site Djadovo shows very good agreement. Comparisons of other archaeomagnetic profiles available for Bulgaria related to the same epoch or sub-epoch will be presented. The expected correspondence can help the refinement of chronology of sites having only stratigraphic profiles.

In our opinion the observed discrepancies between the local PSVCs for a given geographical region might be due mainly to the above described difficulties for elaboration of these curves in the prehistory. The further refinement and updating of existing archaeomagnetic databases will help considerably the elaboration of the newest geomagnetic field models.

Acknowledgement: A partial financial support is from the Project “The archaeomagnetism - a key for solving fundamental problems in geophysics and archaeology”, granted from the Bulgarian National Science Fund.