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## Secular geomagnetic field variations in Bulgarian lands during Classical Age and Late Antiquity – new archaeomagnetic data

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Numerous historical sources and archaeological monuments attest the age of Antiquity in Bulgaria – from both the early Roman period (I – III c.) and Late Antiquity (IV – VI c.). Owing to systematic archaeological excavations, lasting more than 100 years, plenty of information has been accumulated concerning not only all aspects and manifestations of its material culture, but also their evolution and chronology. This in turn allows for interdisciplinary fields such as archaeomagnetism to progress.

There are many archaeomagnetically studied archaeological structures from the Antiquity. The results included in the Bulgarian database form 74 reference points. However, only 20 of them are full-vector determinations because 70 % of the investigated materials are bricks. Hence, the secular variation of declination is poorly constrained within the considered period. Moreover, the reuse of bricks in the constructions occurred quite often (especially in the Late Antiquity) providing for possible errors in archaeological dating. In addition, stronger effects of magnetic anisotropy and cooling rate are usually expected for bricks than for hearths, domestic ovens, production kilns or burnt dwelling remains (there are no results from pottery in the Bulgarian dataset) and both factors are not evaluated for most of the older results. All this can explain the contradictions observed between some of the experimental results juxtaposed over the absolute time scale. In an attempt to clarify these contradictions 13 baked clay structures from eight archaeological sites were archaeomagnetically studied producing seven new directional and eight new intensity data. The samples collected possess variable magnetic properties suggesting differences in clay sources and/or firing conditions. Magnetically soft minerals prevail in seven structures but in the remaining six, abundant HCSLT phase is detected. The success rate of archaeointensity determination experiments vary from 49 to 100 %. It appears that samples containing HCSLT phase always produces good archaeointensity results unlike those with the dominant presence of soft carriers.

The new reference points are compared with the present compilation of Bulgarian archaeomagnetic dataset and with the data from the neighboring countries.

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