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Levantine Paleogeomagnetic intensity Spike at ~3ky BP: archaeomagnetic and C14 evidence from southern Israel

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Archaeoitensity results from Southern Israel have demonstrated unusually high values (VADMs of over 160 Zam$\hat{2}$). Although extraordinary effort has gone into the study of periods of exceptionally low geomagnetic field strength (excursions and reversals), almost no attention has been paid to times of exceptionally high field values. The results from southern Israel lead us to wonder how high can the field get, how fast it can change and over what spatial scale is this peak observed.

Recent study on the geomagnetic field strength as recorded in 2 meters pile of sequential slag and charcoal deposits related to copper production at Timna, southern Israel has produced the sequence of paleofield intensities: 84.6±5.7 μT, 76.4±2.2 μT (layer I), 65±0.6 μT and 67.6±6.1 μT (layer II) and 78.9±1.2 μT (layer III) from bottom to top. Radiocarbon dating suggests that the three distinct archaeological layers spanning ca. 400 years. Dating constraints show rapid changes of the field's strength in particular between the 11th and 10th centuries BCE.

Recently high field values of similar age were also reported from, Jordan, 100 km to the north (Ben Yosef et al., 2008), Greece (De Marco et al., 2008), Western USA (Champion, 1980) and from Hawaii (Pressling et al., 2006) may suggest that this spike of the field was a global SV feature. We speculate that because of the possibility of unrecognized non-linear TRM acquisition behavior, the actual peak field values may have been underestimated and the question of how high the field can get has not yet been answered. Similarly, the lack of high resolution radiocarbon dating has not allowed us to estimate how wide spread the field spike extended around the world and how fast it changed.