

GP41A-0761 - Fast Geomagnetic Field Intensity Decrease Between 500 BC and 250 AD. New Archeointensity Data From South Uzbekistan.



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08:00 - 12:20



Moscone South - Poster Hall

Swirl Topics

Earth Processes - SWIRL

Abstract

Recent archeomagnetic studies provide new evidences for rapid variations of the intensity of the geomagnetic field in the last millennia. In particular, during the first millennium BC, one of the biggest jerks of the geomagnetic field took place. This phenomenon has been observed in the Near East, Israel and Georgia, Germany and Western Europe.

The main purpose of this work is to study the behaviour of the geomagnetic field intensity in Central Asia during the first millennium BC, a region and period of time for which very few high- quality paleointensity data are available. For this purpose, an archaeomagnetic study has been conducted over a collection of 68 ceramic fragments coming from three archaeological sites in the south of Uzbekistan: Kampyr Tepe, where samples from three different sites have been studied: the Citadel (-262 ± 113 BC), the ceramic workshop (-150 ± 50 BC) and the Lower City (-129 ± 41 BC); Kurganzol (-325 ± 75 BC); and Termez, where samples came from different stratigraphic units with ages between 350 BC and 350 AD. The Kurganzol collection has been dated by a variety of archaeological and historical constraints, while the Kampyr Tepe and Termez ceramics were dated by 8 different radiocarbon analyses.

During the first stage of this work, rock magnetism experiments have been conducted on 43 samples in order to identify the principal magnetic minerals responsible for the remanent magnetization. The results show that magnetite and/or Ti-magnetite are the main magnetic carriers. In a second stage, we have conducted paleointensity experiments following the Thellier classical methodology, including the TRM and cooling rate corrections necessary to ensure the reliability of paleointensity estimations. The new results, together with prior high-quality data, confirm that the geomagnetic field underwent a steep dropout in intensity between 600 BC and 100 BC in Central Asia. Finally, the VADM values have been compared with the dipolar moment variation predicted by several global geomagnetic models. This comparison indicates that the VADM values are higher than global model estimations, which might indicate the strong influence of non-dipolar sources upon the rapid decrease observed.

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