

Paleo- and Archeomagnetism

Archeomagnetic dating of a Roman kiln at Frankhplatz, Vienna

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An archeomagnetic study on a Roman kiln from Vienna was conducted. An archeomagnetic dating approach based on the reconstructed field directions yields possible age intervals prior to 50 AD and after 450 AD for the last firing of the kiln.

In the course of construction works for the new metro line U5 a Roman kiln was exposed at Frankhplatz in Vienna (Fig. 1). During the archeological excavation in October 2020, 12 oriented samples were taken from the kiln floor for the purpose of an archeomagnetic study.



Figure 1: Excavation of the Roman kiln at Frankhplatz (© Mosser).

Magnetic investigations have been carried out at the paleomagnetic laboratory of the Conrad Observatory. Specimens were demagnetized, either thermally or within an alternating field, in order to determine the characteristic remanent magnetization. These measurements revealed a strong viscosity of the material. Therefore, measurements were partly repeated and specimens were stored after each demagnetization step in a specific mu-metal container, which acts as a shield against the ambient magnetic field significantly reducing viscous effects. Nevertheless, archeomagnetic directions of the repeated measurements do not show significant differences with respect to previous experiments.

Therefore, all specimens were selected for the final evaluation yielding an average ancient field direction with $D = 0.2^\circ$ and $I = 67.1^\circ$ associated with an uncertainty $\alpha_{95} = 1.4^\circ$. These reconstructed field values were compared to reference curves given by the re-

gional field model SCHA.DIF.4k (Pavón-Carrasco et al., 2021, <https://doi.org/10.1029/2020JB021237>) for the purpose of archeomagnetic dating (Fig. 2). Possible ages for the last usage of the kiln comprise the 4th century BC to the 1st century AD as well as the 5th to the 7th century AD and the 8th to the 9th century AD, respectively.

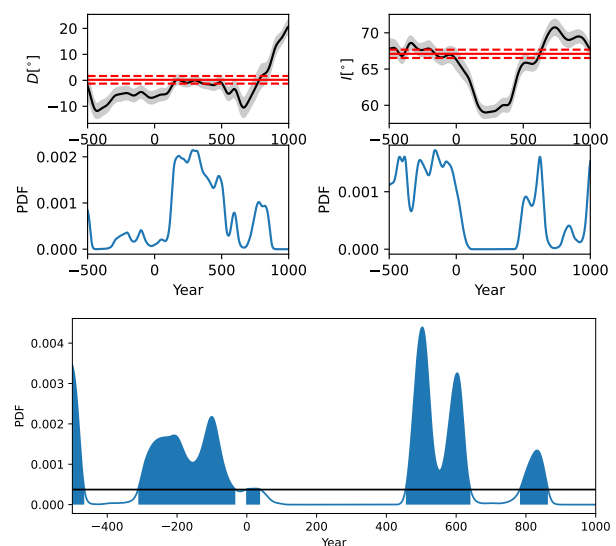


Figure 2: Archeomagnetic dating results. Top: Measured field values for D (left) and I (right) in red, while reference curves are depicted in black. Middle: Corresponding probability density functions for D and I . Bottom: Combined probability density function.

The archeological context, however, suggests the abandonment of the kiln, and thus the last phase of its use, at the end of the 2nd century. This can be proven by stratigraphic criteria and the ceramic dating. This period can currently, from an archeomagnetic point of view, be mainly ruled out due to the differences between the measured inclination and the corresponding reference curve. On the other hand, such archeologically well dated archeomagnetic records will support the refinement of available reference curves.

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