復元窯で焼成された土器の考古地磁気強度実験

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Archeointensity study on earthenwares fired in the reconstructed ancient kiln

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In 1972, a reconstruction experiment of a kiln had been done to reproduce an excavated kiln of the seventh century in Japan. After the experiment baked clay samples were taken from the kiln floor, and they are shown to provide the archeointensity of 47.3 +/- 2.2 (1 stdev) microT which is fairly consistent with the in situ geomagnetic field of 46.4 microT at the time of the reconstruction (Yamamoto et al., 2015). In the experiment earthenwares were also fired and some of them have been stored for archeomagnetic investigation. We have been performing archeointensity determinations on them using the Tsunakawa-Shaw (LTD-DHT Shaw) method, to investigate how reliable the archeointensity can be recovered.

The earthenwares have kept their original shape, that is, they are too large to be subjected to a series of the paleomagnetic analyses using ordinary instruments. Thus we cut them into mini specimens and placed them in plastic cubes typically used for paleomagnetic measurements. Multiple mini specimens could be prepared from each of the earthenwares. So far we have obtained six successful archeointensity results from mini specimens cut from an earthenware cup, giving an average of 48.6 microT with a standard deviation of 1.6 microT. Considering the two standard deviations, the average is consistent with the in situ geomagnetic field of 46.4 microT. We will continue the archeointensity determinations on the other earthenwares and report these results.