須恵器復元窯の試料を用いた新たな考古地磁気強度実験

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New archeointensity results on the samples from the reconstructed ancient kiln

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Yamamoto et al. (2015) reported that baked clay samples from the floor of a reconstructed ancient kiln provided a reliable Tsunakawa-Shaw (LTD-DHT Shaw) archeointensity (AI) estimate of 47.3 +/- 2.2 microT which is fairly consistent with the in situ geomagnetic field of 46.4 microT at the time of the reconstruction. The reconstruction was conducted to reproduce an excavated kiln of the seventh century in Japan and Sue-type potteries of contemporary style were also fired (Nakajima et al., 1974). Two of the potteries with reddish color were recently subjected to the Tsunakawa-Shaw archeointensity determinations, resulting in reliable AI estimates of 45.4 +/- 2.3 (N=6) and 48.2 +/- 2.7 microT (N=15) when specimens were heated in air in laboratory (Yamamoto et al., 2017 JpGU-AGU Joint Meeting).

We have had another opportunity to take samples from a new reconstructed ancient kiln in Japan which was fired in autumn 2016. The samples were two Sue-type potteries with grayish color (bowl-type and plate-type) and some blocks collected from inner wall of the kiln body. They were cut into mini specimens and then subjected to the Tsunakawa-Shaw experiment. Heating in laboratory was done either in air or vacuum.

For the bowl-type pottery, AIs of 46.9 +/- 2.8 (N=6, air) and 45.3 +/- 2.3 microT (N=6, vacuum) are obtained. They are indistinguishable each other and consistent with the IGRF field of 47.4 microT at the reconstructed location in 2016. For the plate-type pottery, AIs result in 41.8 +/- 1.3 (N=4, air) and 43.9 +/- 3.9 microT (N=4, vacuum). They are also indistinguishable each other but the former AI is slightly lower than the IGRF field.

For the inner wall, AIs of 45.0 (N=1, air) and 46.8 microT (N=1, vacuum) are obtained from a right-side wall, and those of 45.5 +/- 2.5 (N=2, air) and 47.7 +/- 3.0 microT (N=2, vacuum) are observed from a left-side wall. They are all indistinguishable and consistent with the IGRF field.