陶邑窯跡群出土土器小片からの考古地磁気強度推定

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Archeointensity estimates from sue-ware ceramic fragments of the Suemura kiln group

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As pointed out in Yamamoto et al. (2015), there has been a long gap in time since the last internationally recognized archeointensity result was published from archeological artifacts in Japan (e.g., Sakai and Hirooka 1986). In contrast, new results with modern paleointensity techniques have been published from East Asia outside Japan: for example, Korea (Yu et al. 2010; Hong et al. 2013) and China (Cai et al. 2014)). A research group in Japan is now conducting a series of researches to obtain new archeointensity results from the artifacts in Japan. One of such researches is that by Kitahara et al. (2019JpGU): they reported new archeointensity results from baked-clay samples taken from a number of kiln floors in the Suemura kiln group, Sakai City, Osaka, Japan. They applied the Tsunakawa-Shaw method to the samples to obtain archeointensities, and showed that an archeointensity was relatively low (about 40 microT) at around the 6th century while that was almost equivalent to the present-day intensity (about 50 microT) at the 5th and the 8th centuries. This intensity trend is inconsistent with the published archeointensities in previous studies in Japan (Nagata et al., 1963; Sasajima and Maenaka, 1966; Sakai and Hirooka, 1986), but is not contradicted from the recently published archeointensities in Korea (Hong et al. 2013).

It is demonstrated that reliable archeointensities can be estimated from sue ware fired in simulated ancient climbing kilns by an application of the Tsunakawa-Shaw method (Yamamoto et al., 2017JpGU, 2017SGEPSS). By a courtesy of the Osaka Prefectural Board of Education, we have obtained sue-ware ceramic fragments of the 5-7th century kilns of the Suemura kiln group, which are counter-parts of the baked-clay samples used in the study of Kitahara et al. (2019JpGU). Each of 4-5 fragments were provided from the different eight kilns (TG22, MT84, TK317, TG51, TG35, TG41-III, MT206, and TG40-III in ascending chronological order). Mini-specimens were cut from the fragments and 65 specimens of them were subjected to archeointensity experiments by the Tsunakawa-Shaw method. In the experiments, the specimens were heated in either air or vacuum for acquisition of laboratory thermoremanent magnetizations. Fifty-two successful results were obtained by application of conventional selection criteria. Except the two kilns TG22 and MT206, an archeointensity could be determined for an each kiln with a relatively low dispersion after discarding a few outlier results: 55.2 +/- 4.9 microT (MT84); 51.2 +/- 6.0 microT (TK317); 43.7 +/- 3.3 microT (TG51); 43.4 +/- 3.7 microT (TG35); 51.5 +/- 3.6 microT(TG41-III); 47.6 +/- 2.1 microT (TG40-III). An intensity trend revealed from these archeointensities generally agrees well with the trend emerged from the results obtained from the baked-clay samples reported in Kitahara et al. (2019JpGU).