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Reexamination of geomagnetic secular variation in Kinki District using samples from Suemura kilns (II)

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In 1960s-70s, enormous number of kilns were excavated in Sakai city and its vicinity, Osaka prefecture for a large residential development. Enhanced archeological studies, especially for massive amount of pottery kilns (Sue ware of 5th to 10th century) were carried out by Osaka Prefectural Government. Archeomagnetic researches were also conducted by prof. Kawai and his colleagues of the Osaka University. As the result, the geomagnetic secular variation curve from the 5th century to the 10th century was drawn (e.g. Hirooka 1971; Shibuya 1980). However, there are problems from the present paleomagentic view point. The natural remanent magnetizations (NRM) were measured by astatic magnetometer and demagnetization was not made. Fortunately, those samples are stocked in Osaka Ohtani University, and we moved them to Okayama Science University and Kumamoto University, for conducting systematic remeasurement study of their NRM after alternating magnetic field demagnetization (AFD). We already reported preliminary results in 2012 JpGU meeting. This time, we finished measuring 1992 samples of 215 sites (80% of the remaining sites).

The most of the measurements are carried out in Kumamoto University. One pilot sample is selected for progressive a.f. demagnetization. If the result is understood strait forward, the remaining samples are submitted to blanket demagnetization with the strength determined from zijderveldt diagram. Otherwise, all the samples are progressively demagnetized. Almost all the samples has very stable magnetization as usual as well baked kiln samples, the difference of magnetic direction of different demagnetization strength is minimal. One in a site is reserved undemagnetized for future paleointensity studies.

The problem reported at the previous meeting is the existence of outliers. They are statistically excluded to get the site mean, and draw tentative PSV curve. Besides the same technique, we made the density map of all the sample direction, and draw the PSV curve as the trace of the ridge of the density. This technique has also advantage that it can utilize the sites of unknown age. The PSV curve obtained is similar to the previous works, though the amplitude of inclination variation is slightly larger. The density map seems to show that there are a few gaps in the density map. It may reflect the gap of the pottery production in the area

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