

A preliminary paleomagnetic result from Lake Suigetsu 2014 cores

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Varved sediments were sampled in Lake Suigetsu by Fukui prefectural government in July to September, 2014. Core samples were collected from four bore holes named E, F, G and H near the center of the lake, c. 500 m. to the east of the deepest place. From hole E, 86 sections with a total length of 83.6 m were recovered, and from hole F we obtained 87 sections with a total length of 85.2 m, 28 of which were magnetically oriented. From hole G, we collected 38 sections, 13 of which were magnetically oriented, in order to fill the gaps in holes E and F cores. Sections from hole H are essentially back-ups. Sub-sampling from each core was made using double-L technique (Nakagawa et al. 2012). Sub-samples are 50 to 100 cm long with a cross section of 2 cm by 2 cm. They were all sealed up in Saran (polyvinylidene chloride) film, and vacuum-sealed with deoxidant agents in an aluminum-lined polyethylene bag, before transported to the laboratory. In addition, cubic specimens with a 2.2 cm side were collected from holes F and G cores in the lakeside workshop, and cubic specimens with a 2.0 cm side were re-sampled from LL-channel samples with a cross section of 2 cm by 2 cm in the laboratory of Kobe University.

Firstly, preliminary paleomagnetic analyses were conducted on two double-L channel samples, with progressive alternating field demagnetizations. All characteristic remanent magnetizations measured at 1-cm regular interval have almost constant directions close to the present geomagnetic field. This suggests the remanence of a core is intensively affected by secondary viscous remanent magnetizations (VRM). Next, we performed preliminary paleomagnetic analyses of discrete specimens with progressive thermal demagnetizations (THD). The result shows that secondary VRMs are removed below 350 °C, and we confirmed that THD was more useful to isolate a primary remanent magnetization than AFD. From preliminary paleomagnetic analyses with progressive THDs for pilot discrete specimens collected from 100 to 10 cm intervals, we have obtained two excursions paleomagnetic directions. One is of an oriented specimen collected at a preliminary composite depth of about 32.50m, having negative inclination and northerly declination, and the other is of an unoriented specimen collected at a preliminary composite depth of 30.25m, having low positive inclination. Both are carried by a component with a temperature range from 400 to 590 °C, which shows the carrier is magnetite. The Lake Suigetsu varve chronology suggests they are dated at 41 ka and 38 ka, respectively. The former or both may be correlated with the Laschamp excursion.

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