

A preliminary paleomagnetic secular variation from varved sediments of Lake Suigetsu, central Japan

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Studies of paleomagnetic secular variation (PSV) are important to reveal the mechanism of geodynamo acting in the outer core, and in addition PSV can be used as a tool of dating of hundreds to thousands yr resolution. Sediments from Lake Suigetsu, Fukui prefectural, central Japan, have annual layers (varves), and thus precise varve chronology has been established, with small errors, e.g. ± 58 years for 20000 years. In addition, the Lake Suigetsu varved sediments have a high accumulation rate of 99 cm/kyr for the last 20000 years. Therefore, high resolution secular variation records can be obtained. The aim of this study is to obtain high-resolution PSV records from Lake Suigetsu varved sediments, and assess the previous PSV records, focusing on the timing of secular variation features.

Varved sediments of Lake Suigetsu were sampled in July to September, 2014, and a total of 274 cores of 1 m length were collected from four holes on the bottom of the lake. In this study, we used 1cm x2cm x2cm double-L channel sub-samples collected from each core. Paleomagnetic analyses were conducted on 43 double-L channel samples, and 16 of 43 are originate samples.

For all samples, we conducted demagnetizations with progressive alternating field up to 80mT and measured magnetizations at 1-cm regular interval. Characteristic remanent magnetization (ChRM) was calculated by principal component analysis. As a preliminary result, inclination and declination variations for last 20000 years were obtained. The PSV of Lake Suigetsu shows many features commonly observed in the Japanese archeomagnetic secular variation for last 2000 years, and also in the Holocene PSV from Japanese lake sediments.

Keywords: paleomagnetic secular variation, varved sediments, Lake Suigetsu, the Holocene