

最終間氷期から氷期にかけての琵琶湖底堆積物の磁気特性

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Magnetic properties of Lake Biwa sediments (BIW08-B) from the last interglacial (Stage 5) to glacial periods (Stage 4)

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Previous studies on rock magnetic properties of piston-core sediments from Lake Biwa revealed that anhysteretic remanent magnetization (ARM) increases in the post-glacial stage and at interstadial intervals in the last glacial period. This result suggests that the magnetic mineral content in Lake Biwa sediments represents hydrological changes associated with climate changes for the last 45,000 years.

We report results of magnetic analysis made on samples of the last glacial and last interglacial period, obtained from bore-hole core samples (BIW08-B core). The BIW08-B core, which was drilled off Okinoshima Island to a subbottom depth about 100 m, mainly consists of lacustrine clay or silty sediments, while fine to medium sand layers are intercalated in the lowermost part. Based on correlations of widespread tephra layers and lithological analysis, the BIW08-B core is assigned with a time period since about 300 ka.

Measurements of ARM made on continuously sampled cubic specimens showed significant variations, which can be correlated with major glacial and interglacial cycles since MIS 5b. We also observed millennial scale variation of the ARM in the glacial period older than 50 ka, although correlations with the Dansgaard-Oeschger cycles and Heinrich events are unclear. Stepwise ARM acquisition experiments up to 100 mT and subsequent AF demagnetization showed that most samples with higher ARM values are characterized by higher magnetic coercivity compared to low ARM samples. In acquisition curves of isothermal remanent magnetization (IRM) up to 1.2 T, we identified at least three coercivity components. Among them, the lower two components of the high ARM samples showed relatively higher coercivity compared to the low ARM samples. These results suggest a possibility that magnetic coercivity analysis provides means of reconstruction of hydrologic conditions in Lake Biwa prior to the last glacial period.