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琵琶湖の湖底堆積物の磁気特性と水理・気候変動との対応
Magnetic properties of Lake Biwa sediments responding to hydrological and climate changes for the last 46 kyrs

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Magnetic analysis of a piston core sample from Lake Biwa (BIW95-4) revealed that anhysteretic remanent magnetization (ARM) increases in the post-glacial stage and at interstadial intervals in the last glacial period (Hayashida et al., 2007). New core samples recovered from other sites in 2007 and 2008 reproducibly extended the ARM record back to 46 ka, featuring major interstadials of Dansgaard-Oeschger cycles and Heinrich events. It is thus suggested the magnetic mineral content in Lake Biwa sediments represents hydrological changes associated with climate changes.

We made rock magnetic analysis of the core sediments in order to identify magnetic minerals carrying the ARM and responding to the millennial-scale climate changes. Comparison of ARM acquisition curves up to 100 mT suggest that samples with higher ARM values are characterized by higher magnetic coercivity compared to low ARM samples, although the difference is not clearly distinguished by IRM acquisition over 100 mT. The variation of magnetic coercivity correlative to the ARM variation is also shown by measurement of hysteresis loops with a vibrating sample magnetometer. Hysteresis parameters displayed in a Day plot show that most data fall in the region of pseudo-single domain (PSD), where the samples with higher ARM provide lower Hrc/Hc and higher Mrs/Ms data. We suggest possibility that the ARM peaks were yielded by increased flux of fine-grained ferromagnetic minerals, such as pedogenic magnetite, possibly associated with enhanced precipitation during the interstadial intervals and the post-glacial period.

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