Magnetic properties and paleomagnetism of piston core sediments from the Oki Ridge, Japan Sea

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During Images VII cruise in 2001, two giant piston cores were recovered from the Oki Ridge and off Akita in Japan Sea. At the same sites, gravity core samples were also obtained during the Kairei 2002 cruise. We are now investigating magnetic properties of these core samples in attempting to obtain high-resolution records of past geomagnetic field and paleoenvironmental changes. In this presentation , we describe results from the IMAGES core MD01-2407.

Core MD01-2407 (55.28 m in length) was recovered at the Oki Ridge in a water depth of 932 m, mainly consisting of alternating layers of homogeneous light colored silty clay and laminated or bioturbated dark colored silty clay, occasionally intercalating volcanic ash layers. The upper 12.3 m of Core MD01-2407 was assigned to oxygen isotope stage 5 and younger based on tephrostratigraphic and lithologic correlation with C-3 Core previously obtained from the Oki Ridge. U-channel samples, typically 1.5 m in length with a 2 x 2 cm square cross section, were collected from the entire sequences and subjected to path-through measurements of low-field magnetic susceptibility (k) and natural remanent magnetization (NRM). We also made alternating field demagnetization of NRM and acquisition experoments of anhysteretic remanent magentization (ARM).

The NRM measurements revealed paleomagnetic inclinations around 56.5 degree, which is expected from the geocentric axial dipole field at the coring site. Anomalous changes of inclination and relative declination was observed at the depth around 6.9 m. Comparison of magnetic concentration parameters, k and ARM, suggests that fine-grained magnetic minerals dominate above 10 m, but they are reduced below. This variation might be caused by diagenetic dissolution of fine-grained magnetite under reductive condition. Relative NRM intensity data normalized with ARM show no good agreement with published paleointensity records (e. g., Sint-800). The relative intensity values are probably affected by dissolution of magnetic minerals by reductive diagenesis.