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掘削残留磁化に汚染された堆積物の古地磁気層序：IODP Exp.322 を例にとって
Magnetostratigraphy of sediments contaminated by drilling induced magnetization: A case study from IODP Exp. 322

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Sediments recovered bydrilling are often affected by drilling induced remanent magnetization (DIRM). Integrated Ocean Drilling Program (IODP) Exp. 322 by D/V 'Chikyu' was one of such a drilling expedition. The DIRM might have been induced by the use of magnetic steel core barrels during rotary coring accompanied by the vibrations, frictions and twisting stress. In some cases, magnetization intensities of DIRM were more than ten times that of natural remanent magnetization (NRM). Typically, DIRM could have been removed by alternating field demagnetization (AFD) up to 10 mT. However, samples heavily contaminated by DIRM showed steep inclinations even after AFD up to several tens of mT. The samples were also contaminated by secondary magnetization during Brunhes (viscous remanent magnetization) and remagnetization events such as injection of fluids into the formation etc. In order to extract reliable polarity of primaly magnetization at the time of deposition as far as possible, we conducted regression analysis proposed by Kirschvink (1980) extensively with the aid of PaleoMag developed by Craig Jones (http://cires.colorado.edu/people/jones.craig/CHJ_PMag_overview.html).

The procedure is based on the recognition of linear segments and/or great circles depending on the contamination levels and degree of overlap on the coercivity spectrum. We could maximize the recognition of reversed polarity interval and minimize the misinterpretation of normal polarity interval at the same time. Some of the samples were identified as doubtful based on clear criteria. Finally we present the resulting magnetostratigraphic interpretation for Hole C0011B and C0012A of Exp.322.

[Reference]
Kirschvink, J. L., The least-square line and plane and the analysis of paleomagnetic data, Geophys. J. R. Astron. Soc., 62, 699-718, 1980.

Keywords: magnetostratigraphy, drilling induced remanent magnetization, Miocene, Pliocene, decontamination, remagnetization circle