

Milankovich cycle and environmental changes recorded in a ferromanganese crust from northwestern Pacific

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A ferromanganese crust D96-m4, which was developed on the surface of basement rock, was taken from Shotoku seamount in the northwest Pacific. The magnetic fields of the thin sections were measured with the SQUID microscope. By correlating the polarity boundaries of the magnetic images (zero crossing lines) with the standard geomagnetic reversal timescale, the age of each zero crossing line was estimated and the growth rate was calculated as 5.1mm per million years (Oda et al., 2011). The beryllium isotope analysis of the same ferromanganese crust provided the growth rate estimate of 6.0 mm per million years, which is almost consistent with the estimate based on the magnetic method. Close investigation on the growth layers revealed the presence of Milankovich cycle for the last two million years including eccentricity (~100kyr) and obliquity (~40kyr). The identification of Milankovich cycle may provide high resolution age models of ferromanganese crusts. In the presentation, we will show the results of geochemical record as environmental changes measured by electron probe micro-analyzer on the crust based on the high resolution age model.

Keywords: ferromanganese crust, northwestern Pacific, magnetostratigraphy, Milankovich cycle, growth layer, geochemical variability