

## Geomagnetic variation extracted from paleointensity of the equatorial and the north Pacific Ocean

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The energy source is the most important problem of geodynamo mechanism. While geomagnetic field is widely believed to be supported by thermal and gravitational energy inside the core (e.g., Jacobs, 1987), recent paleomagnetic studies suggest a possibility of a different energy source: timescales close to the Earth's orbital elements were found as geomagnetic variation (e.g., Yokoyama and Yamazaki, 2000). This indicates an energy source of geodynamo from outside of the core.

To attack this problem it is necessary to collect geomagnetic time series of a long time range and global site distribution. We here analyzed paleomagnetic intensity series over a million years in wide region of the Pacific Ocean to accumulate geomagnetic evidences.

We analyzed three sets of relative paleointensity series. The data series are from the equatorial Pacific sediment cores MD982185 (3 N, 135 E) (Oda and Yamazaki, 2002) and MD982187 (4 N, 134 E) (Oda and Yamazaki, 2005), and from the north Pacific sediment core KR0310-PC1 (35 N, 175 E) (Yamazaki et al., in this session). The common age of the cores is from 300 to 1600 ka. We also analyzed rock-magnetic parameters; IRM, susceptibility, S-ratio, and ARM/SIRM.

After an interpolation into 2 kyr intervals, we transformed each series of the paleointensity and the rock-magnetic parameters into a wavelet space following to Yokoyama and Yamazaki (2000). Wavelet scales of the transform are 40, 80, 160, 320, 640, and 1280 kyr. Among the scales, wavelet signals of 80, 160, and 320 kyr are clear in all series of the relative paleointensity and in most series of rock-magnetic parameters. We hereafter use these three scales.

We first checked an influence of rock-magnetic properties on the relative intensity. We calculated wavelet correlation between the series of the paleointensity and the rock-magnetic parameters of each core. The wavelet correlation coefficients of the three cores are small so that the change of relative intensity in each core is independent from that of magnetic properties.

In order to confirm the independence of the relative intensity variation and to identify its origin, we secondly calculated wavelet correlation among the three cores. As the results, the relative intensity variations of the three cores have correlation in scales of 160 and 320 kyr. While, rock-magnetic parameters do not have correlation. This is because that phases of the rock-magnetic variations are different by cores though there are common scale variations. Whereas relative intensity variations are in-phase, and these must not be originated in the changes of rock-magnetic properties. Furthermore, the relative intensity variation has large spacial scale because the core KR0310-PC1 is far from other cores more than 30 degrees;. Hence, we conclude that the variation of the relative intensity is that of global geomagnetic field.

Yokoyama and Yamazaki (2000) found geomagnetic intensity variation in a scale of 128 kyr in 5 cores during the last 700 kyr. This time, we found variations in scales of 160 and 320 kyr in 3 cores during 1300 kyr. These timescales are close to those of eccentricity, one of the Earth's orbital elements, and this suggests an influence on geomagnetic field from outside the core. We may now in the stage to change our geodynamo model.