

Relative paleointensity for the last 800 kyr from the Indian Ocean: Relationship between inclination and intensity variations

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Paleomagnetic and rock magnetic investigations were carried out on three sediment cores taken from the Ninety-east ridge, the eastern equatorial Indian Ocean. The cores are 4.1-10.2 m long and cover the last 270-790 kyrs with average sedimentation rates of 1.3-1.9 cm/kyr. Generally stable demagnetization behaviors and relatively uniform rock magnetic characteristics allowed to reconstruct relative paleointensity records (NRM30mT/IRM30mT) for each core. The relative paleointensity records showed a beneficial agreement with each other except for the uppermost parts of the cores, and patterns similar to the Sint-800 paleointensity stack (Guyodo and Valet, 1999) and other relative paleointensity records. Spectral analyses of the relative paleointensity records revealed a dominant periodicity at about 100 kyr, but not for the normalizer and other rock magnetic proxies. These results suggested that the 100 kyr periodicity in the paleointensity records during the Brunhes Chron would not be caused by sedimentological effects.

The mean inclination values of the three cores were close to the expected hypothetical GAD direction, which implies that ca. 5-10 degree of negative inclination anomaly (δI) is centered at the western equatorial Pacific Ocean, and not extended to the eastern equatorial Indian Ocean. A comparison between the relative paleointensity variation and δI amplitude between the eastern equatorial Indian Ocean and the western equatorial Pacific Ocean suggests that changes of the GAD intensity control the relative contribution of the persistent non-dipole components and produces the inclination variation.