

FFT Spectrum analysis of magnetic parameters using core MD972142 from southeast of the South China Sea

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ABSTRACT

The South China Sea, a marginal sea of the southwestern Pacific Ocean, situates at the edge of the Pacific Warm Pool. Variation of the Pacific Warm Pool may play an important role on the paleo-environment changes. Moreover, Asia monsoon system would also influence the paleo-environment at this area. Both factors are generally believed to be controlled by the insolation and the orbital forces. High-resolution paleomagnetic records obtained from deep sea sediments would provide a good opportunity to study the paleo-environment change which is induced by the orbital forces, including the eccentricity (100 kyr), the obliquity (41 kyr) and the precession (23kyr). Therefore, in this study, we apply the Fast Fourier Transform (FFT) power spectrum to analyze magnetic parameters of core MD972142 drilled from southeast of the South China Sea. The parameters include magnetic susceptibility (χ), saturated isothermal remanent magnetization (SIRM), back field of isothermal remanent magnetization (bIRM), hard component of isothermal remanent magnetization (HIRM), anhysteretic remanent magnetization (ARM) and ARM/ χ . These parameters represent the abundance and grain size variation of magnetic minerals which are believed to be associated with the changes of paleo-environment. Our preliminary results of spectrum analysis show that only ARM/ χ is mainly dominated by 100 kyr period. It is said that grain size of magnetite is major influenced by the effect of the eccentricity. However, other magnetic proxies, such as magnetic susceptibility, SIRM, bIRM and ARM, which reflect the abundance of difference magnetic minerals show no clear orbital periods. This phenomenon may be explained that the orbital forces do not influence the abundance of magnetic minerals at this area. Furthermore, we think that uncertain age control of the core or the disturbed signals comes from volcanic ash would also affect the results of the spectrum analysis.