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An overview of the magnetic properties of sediments from the South China Sea and their paleoenvironmental significance

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Past changes in the monsoon activity and their consequences in terms of balance between erosion and chemical weathering on land have been investigated with success in the Indian ocean using magnetic properties of marine sediments. Farther east, only scarce data have been accumulated so far.

Here, we present a first study of the magnetic properties on several cores from the Southwestern part of the South China Sea. One site has been sampled during the ODP Leg 184 (site 1143) and the four other cores were taken during IMAGES cruises on board the R. V. *Marion Dufresne* (Wepama and Marco Polo 1 cruises). Based on oxygen isotopic records, the studied sequences cover, depending on the cores, from two climatic cycles (about 200 kyr) to the whole Brunhes period (about 800 kyr). In all cores, changes in grain size of magnetite are observed with alternance between periods of fine grains during interglacial periods and coarse grains during glacial periods. In the time domain, the three orbital periodicities at 100 kyr, 40 kyr and 23 kyr are very significantly expressed in the magnetite grain size records and the cross correlation calculation shows that they are fully correlated with the oxygen isotopes at the three frequencies. Some suborbital variations are also observed, in particular during marine isotopic stage 3. In addition, some changes are also observed in the nature of the magnetic grains supplied to the basin. During glacial times, we observed a significant input of high coercivity minerals (hematite type) which occurs concurrently with the coarsening of magnetite, i.e. during cold stages.

Possible origins (sea level changes, erosion/weathering on land. . .) for these changes will be discussed in terms of their paleoenvironmental significance together with other climatic environmental proxies available in this area.