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Planktic δ18O records in the northern South China Sea: MIS 5.5 vs MIS 1

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Benthic δ18O records show peak and average levels for Marine Isotope Stage (MIS) 5.5, which are 0.1–0.2 ‰ lighter than during MIS 1, a shift that largely results from changes in global ice volume. In planktic δ18O records of the northern South China Sea this trend may grow by 0.1-0.2 ‰ due to both a rise in sea surface temperatures (SST) during MIS 5.5 and enhanced freshwater input. On the other hand, dominant sources of atmospheric humidity may alter from the far distant equatorial Indian (18O depleted) to the nearby West Pacific Ocean (18O enriched), thus significantly influencing the δ18O value of the monsoon-controlled freshwater discharge to the South China Sea (Pausata et al., 2011), and accordingly, the local planktic δ18O signal of surface waters. We tested the role of these possibly opposed factors by means of planktic δ18O records with centennial-scale resolution at ODP Site 1144 (2040 m w.d.; Bühring et al., 2004) and MD05-2904 (2070 m w.d.; Ge et al., 2010). In contrast to an expected 18O depletion for MIS 5.5 of 0.3 ‰ the pertinent core sections were 18O enriched by 0.4 ‰ as compared to MIS 1. This positive shift may either suggest a major and dominant switch in atmosph¬eric water supply from Indian to nearby West Pacific sources or exhibit a loss of the sediment section crucial for MIS 5.5, that is a distinct stratigraphic gap. Highly resolved δ18O records obtained for comparison from three sediment cores retrieved nearby at much greater water depths (ODP Sites 1145, 1146; Core 17924) clearly show for MIS-5.5 the expected δ18O level that is slightly lighter than that of MIS 1, in harmony with increased SST (He et al., 2008), and thus support the hiatus model. It is also corroborated by large fields of (modern) erosional furrows which are generated by a vigorous inflow of Upper Pacific Deepwater passing along the continental slope off Hong Kong near 2350 m w.d. During interglacial MIS 5.5, this current had probably moved upslope by $\sim$200 m as a result of changing density ratios. Current erosion is also recorded by a major seismic reflector at MIS 5.5 in the sediment section of S. 1144.

Bühring et al., 2004, Proc. ODP Sci. Res. vol 184, 1-29.
Ge et al., 2010, J. China Univ. Geosci., 35 (4), 515-524.
He et al., 2008, Chinese Science Bull. 53 (15), 2376-2384,
Pausata et al., 2011, Nature Geoscience 4, 474-480.