Geophysical Research Abstracts, Vol. 9, 04181, 2007
SRef-ID: 1607-7962/gra/EGU2007-A-04181

Millenial scale variability of sea-surface temperatures and planktic assemblages in the Eastern Equatorial Pacific: a comparison of penultimate and last climatic cycles

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Eastern Equatorial Pacific (EEP) is known to be very sensitive to ocean and atmosphere circulation changes at glacial-interglacial and millennial time scales, however, quantitative paleoceanographic data are limited by extensive dissolution of carbonate microfossils in the region. We reconstructed a millennial scale variability in SST (at 10 m w.d.) and productivity during the last two climatic cycles analyzing planktic foraminiferal and coccolithophore assemblages in IMAGES Core MD02-2529 (8˚12.5' N, 84˚ 07.5' W, w.d. 1619 m) with an average sedimentation rate of 10 cm/1000 years and generally appropriate preservation of carbonate microfossils. The stratigraphic framework is based on the benthic d 18O record performed on *C. wuellerstorfi* which showed a slightly more positive values at the end of MIS 2 as compared to the end of MIS 6. MAT-derived mean-annual SST record demonstrates a pronounced difference between penultimate and last climatic cycles, i.e. stronger cooling at late MIS 6 as compared to MIS 2, and MIS 5.5 warmer than MIS 1 by about 1ºC. This SST pattern is explained by a very high (30 – 40 %) content of subsurface cold-water species *N. pachyderma* dex. at $\sim$ 150 kyr with an abrupt decrease in abundance and further disappearance at the very end of MIS 6 till MIS 5.4, whereas during MIS 2 and 1 the species percentage decreased only from 20 to 5. A dramatic shift in *N. pachyderma* dex. content at late MIS 6 is followed by a reverse change in abundance of a relatively warm-water thermocline-dwelling *N. dutertrei*. While other foraminiferal and coccolithophoride species, except for *E. huxleyi* and *F. profunda*, show rather similar glacial-interglacial and millennial-scale variability during the two

climatic cycles, the above mentioned changes in two species suggest a non-analogue situation at late MIS 6. The latter may imply changes in radiative budjet, ocean circulation and/or more persistent La-Nina with a stronger W-E gradient, Walker circulation and Equatorial Undercurrent that resulted in ‘subsurface to surface cooling at our site. Another possible explanation might be a regional reorganization of low-latitude planktic assemblages at the end of penultimate glaciation which is supported by a remarkable difference in foraminiferal assemblages of the penultimate and last climatic cycles, e.g. in the Western Arabian Sea. Alternatively, one can also assume changes in some species behavior like depth habitat preference due to a shift in chlorophyll maximum and/or change in genetic populations. These hypotheses are tested by comparing our record to other low latitude cores.