

Middle Pleistocene transition mechanisms and calcareous nannofossils at ODP Site 1209 (NW Pacific Ocean)

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The middle Pleistocene transition (MPT; 1.25–0.65Myr; Raymo *et al.*, 2004; Clark *et al.*, 2006) represents an important reorganization of the climate that switched from a 41kyr periodicity to a quasi-periodic 100kyr cycle. Despite decades of studies, a solution to the mechanisms driving this revolution is still unclear, and more studies are needed.

The high resolution and good preservation of the sedimentary record recovered at Ocean Drilling Program (ODP) Site 1209 offered the opportunity to investigate the climate and oceanographic evolution of the NW Pacific Ocean during this key time interval. The study of calcareous nannofossil content in 212 samples during the last 1.3Myr revealed a complex distribution of the assemblages through time. We performed a permutational multivariate analysis of variance (PERMANOVA) on the nannofossil dataset to investigate whether the temporal distribution of samples depends on: (1) specific age of each sample, (2) climate phases (i.e., glacial or interglacial), or (3) MPT interval (pre/during/post-MPT). With PERMANOVA, we

formulated and tested these three alternative distribution models and determined that dependence on the MPT effect explained 28% of total variance. Moreover, the canonical analysis revealed that, while the first component regulating the sample distribution could be dependent on the climate system, the second one could be represented by the intrinsic property of the assemblages.

References

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