Geophysical Research Abstracts, Vol. 8, 07269, 2006
SRef-ID: 1607-7962/gra/EGU06-A-07269

Magnetic Signals in Plio-Pleistocene Sediments of the South Atlantic: Implications for Chronostratigraphy and Paleoceanography

F. Schmieder

Department of Geosciences, University of Bremen, Germany (schmiede@uni-bremen.de)

During recent years, magnetic cyclostratigraphy has been successfully established as a very efficient dating tool for marine sediment sequences. In the oligotrophic South Atlantic, confirmation of orbital forcing of magnetic susceptibility records made it possible to establish high-resolution age models, by tuning the respective components to astronomical variations. A set of twelve individually tuned and well-correlated Pleistocene magnetic susceptibility records were stacked within the stratigraphic network SUSAS and can now be used as a correlation reference for other cores recovered in this region. The suitability of this target curve for age control is tested against paleomagnetic ages. Pattern correlation is possible for nine of ten selected gravity cores recovered in the oligotrophic South Atlantic between 15˚S and 35˚S, but seems to be only partly successful for sediments from the Congo Basin. In the Pleistocene sequences, the magnetic age models provide further evidence for the simultaneous deposition of previously reported unusual diatom ooze layers between 23˚S and 33˚S at approximately 540 – 530 ka, at the end of the Mid-Pleistocene climate transition (MPT). The age models also indicate enhanced carbonate dissolution during the MPT interim state (920 – 640 ka). The concept of tuning magnetic susceptibility records to orbital variations is extended to the late Pliocene and reveals characteristics obviously related to the rearrangement of ocean circulation as Northern Hemisphere glaciation intensified. Enhanced carbonate preservation since approximately 3.0 Ma and the establishment of obliquity-driven dissolution cycles since about 2.5 Ma document increasing influx of North Atlantic Deep Water (NADW) into the subtropical South Atlantic. In a deep core from the Rio Grande Rise area, an abrupt change from red deep sea clay to carbonaceous sediments is recorded at 2.73 Ma, at the time proposed for a major intensification of Northern Hemisphere glaciation.