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A relative geomagnetic paleointensity stack for the past 270 kyr from the western continental rise of the Antarctic Peninsula

P. Macrì (1), L. Sagnotti (1), R.G. Lucchi (2) and M. Rebesco (3)

(1) Istituto Nazionale di Geofisica e Vulcanologia, Rome, Italy, (2) GRC Geociències Marines, Universitat de Barcelona, Spain, (3) Istituto Nazionale di Oceanografia e di Geofisica Sperimentale (OGS), Trieste, Italy. (macri@ingv.it / fax: +39 0651860397).

We carried out a paleomagnetic investigation on four gravity cores (SED-14, SED-15, SED-16 and SED-17) recovered from the western continental rise of the Antarctic Peninsula during the SEDANO II cruise of RV OGS-Explora. The cores were collected on the sediment Drift 7, and consist of fine-grained sediments spanning through various glacial-interglacial cycles. Analysis of paleomagnetic and rock magnetic data allowed to reconstruct relative paleointensity (RPI) records (NRM20mT/ARM20mT) for each core. We established a refined age model for the sequences by correlating these SEDANO RPI curves to the global RPI stack SINT-800. The individual normalized RPI records are in mutual close agreement, they were thus merged in a SEDANO RPI stacking curve showing a low standard deviation and providing a high-resolution image of the geomagnetic field variation at the southern high latitudes for the last 270 kyr. This study also points out that RPI records may provide a viable tool to date otherwise difficult-to-date sediments such as those deposited along peri-Antarctic margins. The new RPI chronology indicates that the sedimentary sequence is younger than previously thought and allows a new high-resolution correlation to oxygen isotope stages. Furthermore, we recognized variations in the rock magnetic parameters that appear to be climatically-driven, with changes in the relative proportion of two magnetic mineral populations with distinct coercivities. Rock magnetic and lithological trends observed in the SEDANO cores indicate that during the climatic cycles of the late Pleistocene this sector of the peri-Antarctic margin was subjected to subtle, yet identifiable, environmental changes, confirming a relative higher instability of the West Antarctic ice sheet with respect to the East Antarctic counterpart.