Geophysical Research Abstracts, Vol. 8, 04291, 2006
SRef-ID: 1607-7962/gra/EGU06-A-04291

Magnetic proxy evidence for Deep (Pacific) Western Boundary Current flow variability over the Middle Pleistocene Transition and its relationship with the Antarctic Circumpolar Current

A. Venuti (1), F. Florindo (2), E. Michel (3) and I. Hall (4)

(1) Università degli Studi di Siena, Via del Laterino 8, 53100, Siena, Italy, (2) Istituto Nazionale di Geofisica e Vulcanologia, Via di Vigna Murata 605, 00143, Roma, Italy, (3) Laboratoire des Sciences du Climat et de l'Environnement, Gif/Yvette cedex, France, (4) School of Earth, Ocean and Planetary Sciences, Cardiff University, PO Box 914, Cardiff CF10 3YE, UK

The Deep Western Boundary Current (DWBC) inflow to the southwest Pacific Ocean forms part of a global system of ocean circulation which distributes heat around the planet, and may play a key role in controlling climate change. It is the largest DWBC in the world ocean feeding some 40% of the world's newly formed, cold deep water to the oceans. Here we use a sedimentary record from core MD97-2114 (42°22.32'S; 171°20.42'W) located on the northern flank of Chatham Rise, east of New Zealand. We intend to reconstruct its flow variability during the Pleistocene epoch when the period of glacial cycles changed progressively from 41,000 to 100,000 years. In magnetic and isotope proxies we find evidence for an external forcing mechanism driving the dynamics of the Deep (Pacific) Western Boundary Current over the past million years. The ARM/IRM magnetic parameter, being a good indicator of grain-size variations of magnetite in the sediment, is used as paleohydrographic proxy. On a long-term trend, the vigour of this flow is characterized by a switch-like behaviour with two main perturbations centered at 870 ka (MIS 22) and 450 ka (MIS 12). We discuss whether this is increased AAIW and AABW production or could be reflecting momentum imparted by an energized ACC.