Geophysical Research Abstracts, Vol. 7, 03142, 2005
SRef-ID: 1607-7962/gra/EGU05-A-03142

The ice core record and the CO_2 paradox of marine isotopic stage 11

D. Raynaud and J-M. Barnola

Laboratoire de Glaciologie et Géophysique de l'Environnement, CNRS, Saint-Martin-d'Hères, France (raynaud@lgge.obs.ujf-grenoble.fr / Fax: + 33 4 76824201 / Phone: +33 4 76824252)

The marine Isotopic Stage (MIS) 11, about 400 kyr ago, is a unique interglacial period in the Earth's climate history, which is often considered as a close analogue of what the current interglacial, the Holocene, would have been like, free of anthropogenic perturbation. MIS 11 lasted longer with weaker orbitally driven insolation changes than the following interglacials. Moreover the paleorecord indicates unusual climatic and oceanic carbon cycle characteristics. Drastic changes are observed in the distribution of marine carbonates, and changes, like the transfer of $CaCO_3$ deposition from deep sea to shallow shelf during the building of coral reefs, could have largely affected the atmospheric CO_2 concentrations. By combining the information obtained on the Vostok and EPICA DC ice cores, we have been able to obtained for the first time a CO_2 record covering the entire MIS 11 period. Paradoxically, it indicates CO_2 levels all over the MIS 11 interglacial similar to those observed during the pre-industrial Holocene, despite the drastic changes observed in the oceanic carbon cycle. This apparent paradox, which will be discussed, provides a test for the models predicting a significant increase in atmospheric CO_2 following a change in carbonate distribution.