Geophysical Research Abstracts, Vol. 7, 03558, 2005
SRef-ID: 1607-7962/gra/EGU05-A-03558

The Mid-Pleistocene Revolution (MPR) and the Mid-Bruhnes Transition (MBT): the view from the ice core and marine sediments records

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The description of Quaternary climate is largely based on deep-sea isotopic records of ice-volume changes. The MPR, at about 900 kyr BP, is characterized by an increase in mean global ice volume and a change in the dominant orbital period from 41 to 100 kyr. The MBT is another distinct climate boundary, after which a mode of 4 large-amplitude glacial-interglacial cycles dominated by the 100 kyr period has been in operation to the present day.

Sediment cores collected during the ODP and IMAGES programmes document changes of ice volume, sea surface temperature, carbonate dissolution, atmospheric circulation and wind during the last million years and may be closely compared to the ice record. They show a worldwide peak of dissolution linked with isotopic stage 11 (associated with a long-term cycle) and that the amplitude of the glacial/interglacial cycles increased after MBT.

The Antarctic Vostok ice core provides compelling evidence of the climate forcings and atmospheric responses over the past 420,000 years. The evidence includes greenhouse gases, Antarctic temperature and snow accumulation, atmospheric circulation and wind The recent recovery of the EPICA DC (EDC) ice core offers the possibility to extent the ice core record back to 800,000 years ago, and especially to investigate the MBT and the marine isotopic stage 11. It shows less pronounced warm but longer interglacials in Antarctica prior MBT. The EDC drilling operation has been completed in December 2004, which will hopefully extent the record close to the MPR.

The presentation will focus on the description of the most recent records and on the comparison between the marine and ice archives.