Geophysical Research Abstracts,
Vol. 10, EGU2008-A-10893, 2008
SRef-ID: 1607-7962/gra/EGU2008-A-10893
EGU General Assembly 2008

The continuous dust record (150kyr) from the EPICA-DML ice core, Antarctica: evidence for a sea ice influence on atmospheric circulation

U. Ruth (1), M. Bigler (2,5), B. Delmonte (3,4), H. Fischer (1), R. Gersonde (1), P. Kaufmann (2), F. Lambert (2), Jean-Robert Petit (4), Mirko Severi (6), A. Wegner (1),

(1) Alfed-Wegener-Institute for Polar- und Marine Research, Bremerhaven, Germany, (2) Climate and Environmental Physics, University of Bern, Switzerland, (3) University of Milano-Biccoca, Milano, Italy, (4) LGGE-CNRS, Grenoble, France, (5) Niels-Bohr Institute, University of Copenhagen, Denmark, (6) University of Florence, Florence, Italy (uruth@awi-bremerhaven.de)

The European Project for Ice Coring in Antarctica (EPICA) aims at reconstructing past climate and environmental conditions from two deep ice cores in Antarctica (EDML and EDC). We present concentration and size distribution data of aeolian dust from the EDML core over the last 150 kyr and compare it to the dust data from EDC.

Owing to highly synchronized time scales it can be seen that all mayor climatic changes lead to synchronous changes of dust flux for the two sites, which indicates a common source or a common variation of the respective sources. The ratio of dust concentration at EDML and EDC is found to be moderately variable (factor $\sim$3); probably caused by variable efficiency of atmospheric transport from the source to the two sites.

During Termination I a regime shift at the onset of the ACR can be observed in both cores: The time before (older than) the ACR is characterized by a high correlation between dust concentration, mean particle size and isotopic temperature, while the period after shows no or weak correlations, respectively. This can be observed also in other parts of the record, e.g. during MIS5. At DML, periods of weak correlations show frequent occurrence of large particles in the core, indicating that dust storms

were able to penetrate directly into DML during these times. These periods coincide with minimum sea ice in the Atlantic sector of the Southern Ocean as inferred from marine sediment cores. Thus, the sea ice extent in the Atlantic sector may have had an important influence on atmospheric transport patterns around Antarctica as well as on the connection of temperature with wind speed and aridity in the source areas.