Geophysical Research Abstracts, Vol. 9, 08083, 2007
SRef-ID: 1607-7962/gra/EGU2007-A-08083

Fluctuations of the Antarctic atmospheric circulation from statistical analysis on EPICA – Dome C high – resolution chemistry data

F. Lambert (1), D. Sonechkin (2), M. Bigler (1,3), PR. Kaufmann (1), E. Castellano (4), M. Severi (4)

(1) Physics Institute, University of Bern, Switzerland, (2) Academy of Sciences, Moscow, Russia, (3) Niels Bohr Institute, University of Copenhagen, Denmark, (4) Department of Chemistry, University of Florence, Italy

In the framework of the European Project for Ice Coring in Antarctica (EPICA) an ice core has been drilled on the East Antarctic Plateau at the Dome C site (75˚06' S, 123˚ 21'E), reaching 3259 m depth. Continuous measurements of several different ions have been performed at a resolution of approximately 1 cm with a Continuous Flow Analysis (CFA) system.

Here we present the dust, sodium, calcium, and electrolytic conductivity records from CFA analysis over the past 900 ka and going back to Marine Isotopic Stage (MIS) 20. Calcium is mainly related to continental aerosols from southern South America, whereas sodium basically derives from sea salt aerosols.

Wavelet analysis was performed with a special program that processes non-equally spaced data points. Variations in the wavelet transform of the records seem to be amplitude modulated. This suggests an unstable response of the climatic system to external forcing.

Empirical orthogonal function (EOF) analysis on 100 year mean values shows that marine components of CFA data share equal sources and transport conditions between themselves and so do terrestrial components.