Geophysical Research Abstracts,
Vol. 10, EGU2008-A-09848, 2008
SRef-ID: 1607-7962/gra/EGU2008-A-09848
EGU General Assembly 2008
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Dust in Antarctica during the Holocene

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Four Holocene East Antarctic ice cores from Dome B, Vostok, EPICA Dröning Maud Land and EPICA-Dome C have been analysed for dust concentration and size distribution at different temporal resolution

Initially analysed by Delmonte et al, 2005, the Vostok and EDC data analysis suggested a variability of microparticle transport patterns at regional scale and a persistent seesaw phenomenon occurring during most of the Holocene with periodicity of about 200 years leading Dome C and Vostok under different atmospheric regimes. An analogue seesaw phenomenon was already observed in East Antarctica (Delmonte et al, 2004) during Termination I. Adopting the same interpretation, the dust size variability observed suggested a persistent atmospheric dipole over East Antarctica influencing alternatively Vostok and Dome C. Interestingly, its pronounced 200-years band oscillation opened discussion to its link with the solar activity.

However the analyses of two other cores, the study of different time scale and the use of wavelets analyses as a tool for instationarity in signal, draw a different pattern. Indeed at the Holocene scale the pattern of the different record appears not comparable each other but with record around Antarctica (Sea Ice, Westerlies),... For the last 3000 years, the study of firn in Vostok and Dome C are not comparable. The frequency content does not allowed to link a process involving global forcing factor. For the decadal time scale, pit samples in Dome C and Vostok are not equivalent too and 2

pits at the same location do not highlight similar pattern.

All these observations imply an Atmospheric circulation complex, and the study of other proxies (Isotope, Deuterium Excess) suggests that Antarctica seems to be isolated from the rest of the world during the last interglacial.