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EPICA Dome C ice Dust vs Southern Hemisphere Potential Source Areas sediments: dust source identification and its geochemical evolution over the last two glacial cycles.

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Because of the influence of changes in climatic and environmental conditions (e.g. type and extent of vegetation cover and hydrological cycle) on continental surfaces, fine sediments able to be deflated from surface and transported in the atmosphere as windblown dust, show changing geochemistry of the mineral assemblages in different climatic regimes. Therefore, the characterization of the chemical composition of dust deposited on polar ice sheets in the past allows to investigate paleo-environmental modifications occurred at the dust source areas, for a better comprehension of climatic and environmental reconstructions.

We present here the geochemical characterization of dust deposited during the last two glacial cycles at Dome C (East Antarctica) obtained by PIXE (Particle Induced X-ray Emission) technique. Major and minor elements (Si, Al, Fe, Ca, Na, Mg, K and Ti), constituting more than 99% of the total dust mass are detected along the core, showing a high co-variations with the dust record; on the other hand, compositional differences among the three main cold stages investigated (LGM, MIS 4 and MIS 6), and differences in the compositional variability among interglacial (Holocene and

MIS 5.5) and glacial periods come up from the study of the relative geochemical compositions.

Besides, the comparison between polar dust and Southern Hemisphere PSAs (Potential Source Areas) sediments chemical composition, helps in the individuation of dust source areas in different past climatic regimes, linked to changes of environmental conditions at the source and/or different scenarios of atmospheric transport. At this purpose the EDC data set is here compared with data coming from literature and with data obtained by PIXE on the finer ($< 5\mu$m) fraction of sediments collected in the main SH-PSA: Southern South America, Australia, South Africa, New Zealand and Antarctic deglaciated areas.

Glacial dust appears to be mainly transported from the Southern South America regions, with a predominant role of the Pampas area - at least during LGM - even if evidences for a possible role of local sources cannot be ruled out. Conversely, interglacial dust shows a higher compositional variability that can be linked to environmental changes occurred differentially between glacial and interglacial stages in the continental areas and pointing to a possible different source mixing in which a second source (likely Australia) could have a large role.