



Magnetic properties of aerosol dust in Antarctic ice cores as a proxy for dust provenance

L. Lanci (1) and B. Delmonte (2)

(1) Dept. DISTEVA, University of Urbino "Carlo Bo", Urbino, Italy (luca.lanci@uniurb.it), (2) Dipartimento di Scienze Ambientali, University of Milano-Bicocca, Milano, Italy

Laboratory-induced remanent magnetization of polar ice is a measurement of the magnetization carried by the ferromagnetic dust particles in the ice. Ferromagnetic minerals in the aerosol dust have variable rock-magnetic properties and concentration that are directly related to the source material and transport dynamics. Magnetic methods, which are particularly effective in recognizing volcanic material and highly oxidized soils, can be used as a tool to discriminate among aerosol dust sources. In Antarctic ice the rock-magnetism of aerosol dust showed, in fact, distinct properties in ice from glacial and interglacial periods that may reflect different dust source areas. The comparison of magnetic properties of ice samples with that from Possible Source Area (PSA) samples shows a general good agreement between South American PSA and glacial ice dust. However, many questions are risen when considering the magnetic properties of interglacial samples from both Dome-C and Talos Dome ice cores. No good agreement has been found between interglacial samples and any of the measured PSA samples from the most common areas, suggesting that these cores have a significant contribution of dust from a source that has not been yet taken into consideration. In particular, the extremely high IRM measured in some interglacial samples is likely to be explained only with a large concentration of Fe-rich rocks such as volcanic or meteoritic material.