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Set up of a coupled ICP-SF-MS - ICP-OES method for the geochemical characterization of oceanic sediments and its application to the analyses of ANDRILL-MIS samples.

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The ANDRILL (ANtarctic DRILLing) project aims to study the role of the Antarctic Continent within the global climatic system, by the recovery and analysis of two deep sediment cores (named MIS and SMS) drilled close to the margin of the Ross Ice Shelf.
Because of the strategic location of the MIS core, the ANDRILL project is providing basic information about the dynamic (in terms of cycles of advances and retreats) of the Ross Ice Shelf, one of the more vulnerable part of the Antarctic Continent to the possible future climate changes. In particular the study of the geochemical composition of sediments along the MIS core can provide information about the possible source of terrigenous material deposited over the drilling site; such information are basic for the understanding of the role of single glaciers flowing from the West and East Antarctic Ice Sheets and feeding the Ross Ice Shelf.
At the Department of Chemistry of the University of Florence, the geochemical composition of sediments is obtained by the coupled application of ICP techniques (ICP-OES and HR-ICP-MS) for the determination of the major and trace elements bulk composition.
Preliminary results about the geochemical composition of sediments deposited during the last Ma at the MIS site suggest different rock sources for the material deposited during the first and last about 0.5 Ma, with the oldest sediments showing a composition more similar to that typical of Trans-Antarctic Mountains and the youngest showing characteristics typical of McMurdo volcanic rocks composition. Such different composition could be linked to the different global climatic conditions that characterized the two intervals of the last Ma, with the oldest part characterized by shorter, and in general cooler, climatic cycles and the last part eccentricity-modulated and characterized by an overall milder climatic regime.