

## **X-ray spectroscopy and ice core science: first results and climatic evidences from the Talos Dome ice core (East Antarctica, Ross Sea sector)**

Giovanni Baccolo<sup>1,2,3</sup>, Giannantonio Cibin<sup>4</sup>, Barbara Delmonte<sup>2</sup>,  
Dariush Hampai<sup>5</sup>, Valter Maggi<sup>2,3</sup>, Augusto Marcelli<sup>5,6</sup>

<sup>1</sup>*University of Siena, Earth Science Department, Siena, Italy*

<sup>2</sup>*University of Milano-Bicocca, Environmental Sciences Department, Milano, Italy*

<sup>3</sup>*INFN, Milano-Bicocca section, Milano, Italy*

<sup>4</sup>*Diamond Light Source Ltd., Didcot, United Kingdom*

<sup>5</sup>*INFN-LNF, P.O. Box 13, 00044 Frascati, Italy*

<sup>6</sup>*RICMASS, Via dei Sabelli 119A, 00185 Rome, Italy*

Ice cores are properly considered some of the the most important climatic archives. Thanks to the processes leading to the deposition of snow layers on glacial surfaces and to their successive transformation into ice, glaciers are capable of preserving an invaluable amount of climatic information. Among the many proxies that is possible to investigate, a key role is played by the atmospheric mineral dust contained inside the ice layers.

In the past years we developed a new spectroscopical method based on synchrotron radiation for the geochemical characterization of polar ice core dust retrieved from TALDICE (TALos Dome ICE core, East Antarctica, Ross Sea Sector). Here we present the preliminary results obtained through an extensive analysis of TALDICE ice core carried out using XRF and XANES techniques at Diamond B18. Thanks to its tunability and brilliance, synchrotron radiation allowed to investigate unexplored geochemical and mineralogical aspects of the atmospheric dust deposited in Antarctica. Considering other climatic proxies it was also possible to infer some first climatic evidences which improve our understanding of the relationship between the atmospheric dust cycle and the climate in the Southern hemisphere.

Email corresponding author: [giovanni.baccolo@mib.infn.it](mailto:giovanni.baccolo@mib.infn.it)