



Comparison of analytical methods used for measuring major ions in the EPICA -Dome C ice core

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A deep ice core was drilled at Dome C within the framework of the European Project for Ice Coring in Antarctica (EPICA), and the ionic analysis of this ice core has been performed at high resolution.

In the past, ionic analyses of deep ice cores tended to consist of a few widely spaced measurements that indicated general trends in concentration. The traditional discrete ion-chromatographic methods (IC) widely used give well-validated individual data, but are very time-consuming. The development of continuous and semi-continuous techniques has allowed very rapid and high-resolution data to be collected in the field for a wide range of ions.

Most of the ions have been measured in six different laboratories by IC, at resolutions between 2.5 and 10 cm and also at 55cm resolution in some parts. In the field, the Continuous Flow Analysis (CFA) was used to measure the ions Na, Ca, nitrate and ammonium. Additionally a new semi-continuous in situ ion-chromatographic method (known as FIC) was used to analyse sulfate, nitrate and chloride. Data is now available to a depth of 3190 m, and several soluble species have been analysed by more than one analytical method.

In this presentation we compare along the core the levels measured by discrete IC in the different laboratories, and also the data obtained by the three analytical methods. We assess the level of agreement between laboratories and analytical techniques in order to provide a validated dataset for scientific interpretation.