Abstract ID : **129**

Developing continuous flow analysis capability for Million Year Ice Core analysis.

Content

As part of the IPICS oldest ice initiative, Australia is contributing through the Million Year Ice Core Project (MYIC). The analysis of impurities is fundamental to ice core interpretation, and this search for oldest ice in Antarctica brings analytical challenges, with large amounts of ice to be measured in a timely manner at a high resolution. To meet these challenges we have developed a continuous flow analysis (CFA) system for greater sample throughput and depth resolution compared with discrete sampling. The system produces a clean stream at 8 ml/min and 1.5 cm/min melt rate, from 33-35 mm ice sticks. Continuous measurements of conductivity, particles, hydrogen peroxide, water isotopes, sodium and calcium ions are made, while other trace ions will be measured by ion chromatography on collected fractions. Conductivity measurements are made using traditional and contactless instruments at multiple points in the system for bubble detection and synchronisation of signals. Continuous methane measurements will be made using a Picarro gas analyser, complementing the discrete small volume gas analysis being developed.

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Track Classification: The Oldest Ice challenge, and the preservation of climatic signals in the deepest ice