Abstract ID : **200**

Investigating the use of excess meltwater from Continuous Flow Analysis for the measurement of cosmogenic radionuclides in ice cores

Content

Cosmogenic radionuclides are produced in the Earth's atmosphere by the interaction of its constituents with the incoming flux of galactic cosmic rays, which is modulated by the Sun's and the Earth's magnetic field. In this study, we present the first 10Be record measured from Continuous Flow Analysis (CFA) excess water samples. We collected the excess water from the outer part of the ice core sample (not suitable for the measurement of impurities and that would be otherwise discarded), from the EGRIP S6 firn core. The suitability of these samples for cosmogenic radionuclide measurements would open the possibility of producing continuous 10Be records with less time-consuming preparation and to save valuable ice for other measurements. To test this new method, we compare the 10Be concentrations obtained from CFA excess water samples from the EGRIP S6 firn core to 10Be concentrations from discrete samples from the same core. Furthermore, by investigating the presence of the 11-year solar cycle in the two records, we explore the suitability of CFA excess water samples for the reconstruction of solar activity. We find that the CFA excess water 10Be record agrees very well with the 10Be record directly obtained from the firn. This technique was also tested in connection to the recent discovery of a sharp 10Be peak associated to an extreme solar energetic particle event 9,125 years BP near a solar minimum, confirming that 10Be measurements from CFA excess water are suitable for the reconstruction of solar activity and the detection of solar storms.

Primary author: PALEARI, Chiara (Department of Geology, Lund University)

Co-authors: MEKHALDI, Florian (Lund University); ERHARDT, Tobias (AWI Germany); ADOLPHI, Florian (Alfred Wegener Institute Bremerhaven); ZHENG, Minjie (Lund University); CHRISTL, Marcus (Laboratory of Ion Beam Physics, ETH Zürich, Zürich, Switzerland); HÖRHOLD, Maria (Alfred-Wegener-Institute Helmholtz-Zentrum für Polar- und Meeresforschung); MUSCHELER, Raimund (Department of Geology, Lund University, Lund, Sweden)

Presenter: PALEARI, Chiara (Department of Geology, Lund University)

Track Classification: Progress in proxy development and interpretation