



Abstract ID : 318

The preliminary results of a shallow firn ice core from the Southern lobe of Pine Island Glacier Basin, West Antarctica.

Content

Pine Island Glacier, located in West Antarctica, is an extremely important region for the Antarctic ice sheet, responsible for transporting a large parcel of ice from the western sector annually. The accelerated decline observed in this glacier since the 1990s has caused an increase in ice discharge in this sector. This work uses a 5.0 m deep firn core (TT08) collected in the southern lobe of the Pine Glacier basin (79°07'23.3" S; 96°22'30.6" W; 1870 m) in January 2015 on the Brazilian traverse to the WAIS. To collect the TT08 core, the Mark III drilling system (Kovacs Inc., USA) was used. The TT08 firn core sections were melted by the CCI/UMAINE continuous melting system with subcentimeter discrete sampling. In the laboratories of the Polar and Climatic Center (CPC/UFRGS; Brazil) we execute the analyses of the ion content by ion chromatography (IC; with two Dionex™ systems, models ICS-2000 and ICS-2100) and of the stable isotope ratios by laser spectroscopy (WS-CRDS; L2130-i system, Picarro Inc., USA) to identify seasonal and annual chemical and climatic variations preserved in the TT08 core. For isotopic analysis, the reproducibility of measurements is typically 0.8 ‰ for δD and better than 0.2 ‰ for $\delta^{18}O$. We computed a mean of -34.31‰ for $\delta^{18}O$, -271.22‰ for δD , and 3.17‰ for d-excess. By the seasonal variation of the isotopes, it was possible to estimate a record of 11 annual cycles, with an average accumulation rate of 0.21 m H₂O eq. per year. We verified a slight positive trend in the isotopic signal, which can be interpreted as atmospheric warming in recent years, as well as if it has been observed in the region. Processing of the ionic content data is still in progress, and we hope that once they are complete they will be able to corroborate the isotope data for a more detailed and accurate interpretation.

Keywords: stable isotopes, Ionic content, shallow firn core, West Antarctica.

Primary author: ROCHA, Renée (Centro Polar e Climático, Universidade Federal do Rio Grande do Sul, Brazil.)

Co-authors: SIMÕES, Jefferson C (Centro Polar e Climático, Universidade Federal do Rio Grande do Sul, Brazil; Climate Change Institute, University of Maine, USA); BERNARDO, Ronaldo (Centro Polar e Climático); THOEN, Isaías (Centro Polar e Climático, Instituto de Geociências, Universidade Federal do Rio Grande do Sul (UFRGS)); MARCHER DE OLIVEIRA, Andressa (Centro Polar e Climático, Universidade Federal do Rio Grande do Sul)

Presenter: ROCHA, Renée (Centro Polar e Climático, Universidade Federal do Rio Grande do Sul, Brazil.

Track Classification: New ice archives