Geophysical Research Abstracts
Vol. 19, EGU2017-10478, 2017
EGU General Assembly 2017

125,000 year Arctic sea ice variability from the Renland ice core.

Niccolò Maffezzoli (1), Paul Vallelonga (1), Andrea Spolaor (2,3), Carlo Barbante (3), Ross Edwards (4), Alfonso Saiz-Lopez (5), Helle Astrid Kjær (1), Marius Simonsen (1), and Bo Vinther (1)

(1) Copenhagen University, Niels Bohr Institute, Centre for Ice and Climate, Copenhagen, Denmark (maffe@nbi.ku.dk), (2) Ca'Foscari University of Venice, Department of Environmental Sciences, Informatics and Statistics, Via Torino 155, 30170 Venice Mestre, Italy. , (3) Institute for the Dynamics of Environmental Processes, IDPA-CNR, Via Torino 155, 30170 Venice Mestre, Italy., (4) Physics and Astronomy, Curtin University of Technology, Kent St, Bentley WA 6102, Australia., (5) Department of Atmospheric Chemistry and Climate, Institute of Physical Chemistry Rocasolano, CSIC, Serrano 119, 28006 Madrid, Spain

Sea ice is a crucial parameter in the climate system, and it is declining at a faster rate than model predictions. Both seasonal and multiyear Arctic sea ice have suffered a consistent area reduction of since the 1980s-satellite era. In the framework of a warming climate and a sea ice decline, the reconstruction of sea ice is of crucial importance to predict its future trend.
Bromine and sodium are present is sea salt aerosol and several condensed saline phases on sea ice surfaces. Bromine plays a central role in the sea ice chemistry in the polar boundary layer through recycling multiphase reaction over sea salt aerosol and fresh sea ice surfaces that lead to exponential release of gas phase bromine during springtime. Therefore, bromine enrichment in snow, with respect to sodium in seawater, has been linked to first year sea ice variability in the Arctic and Antarctica.
We present here bromine enrichment variability driven by Arctic sea ice, from measurements in the Renland ice core (71.3°N 26.5° W, East Greenland). The core provides a detailed record of the Holocene, extending back to the last interglacial period, the Eemian. Directly facing the East coasts of Greenland, the bromine enrichment record in Renland might allow the first glacial-interglacial reconstruction of sea ice in this sector.