EGU21-1321
https://doi.org/10.5194/egusphere-egu21-1321
EGU General Assembly 2021

The unique behavior of stable water isotopes profiles during interglacial periods at Talos Dome, Antarctica

Ilaria Crotti[1,4], Amaelle Landais[4], Barbara Stenni[1], Massimo Frezzotti[3], Aurélien Quiquet[4], Frédéric Prié[4], Bénédicte Minster[4], Giuliano Dreossi[2], and Carlo Barbante[1,2]

[1]Cà Foscari University of Venice, Department of Environmental Sciences, Informatics and Statistics, Venice, Italy
[2]Institute for Polar Sciences (ISP), CNR, Venice, Italy
[3]Department of Science, Roma Tre University, Rome, Italy
[4]Laboratoire des Sciences du Climat et de l'Environnement IPSL/CEA-CNRS-UVSQ UMR, Gif-sur-Yvette, France

The growth and decay of marine ice sheets act as important controls on regional and global climate, in particular, the behavior of the ice sheets is a key uncertainty in predicting sea-level rise during and beyond this century. The East Antarctic Ice Sheet (EAIS), which contains deep subglacial basins with reverse-sloping, is considered to be susceptible to ice loss caused by marine ice sheet instability. Sediment core offshore Wilkes Subglacial Basin reveals oscillations in the provenance of detrital sediment that have been interpreted to reflect an erosion of Wilkes Basin during interglacial periods MIS 5, MIS 7, and MIS 9 greater than Holocene period (Wilson et al., 2018). The aim of our study is to investigate past climate and environmental changes in the coastal area of the East Antarctic Ice Sheet during MIS 7.5 and 9.3 with the help of a new high-resolution water isotopes record of the TALDICE ice core.

Here we present new $\delta^{18}O$ and δD high resolution (5 cm) records covering the oldest portion of the TALDICE ice core. MIS 7.5 and 9.3 isotopic signal reveals a unique feature, already observed for MIS 5.5, that has not been spotted in other Antarctic ice cores (Masson-Delmotte et al., 2011). Interglacial periods at TALDICE are characterized by a first peak, observed in correspondence to the culmination of the deglaciation event as for all Antarctic cores, followed by a less pronounced isotopic peak (for MIS 5.5 and 9.3) or a plateau (for MIS 7.5) prior to the glacial inception. Several factors might drive this peculiar behavior of the water stable isotopes record, as an increase in temperatures due to a drop in surface elevation or changes in moisture sources.

The new $\delta^{18}O$ and δD high-resolution records for the TALDICE ice core reveal a unique pattern that characterizes interglacial periods at Talos Dome. Taking into account the coastal position of the core and its vicinity to the Wilkes Subglacial Basin we intend to investigate the possible decrease in surface elevation, through the application of the GRISLI ice sheet model (Quiquet et al., 2018), and changes in moisture sources, traceable from the d-excess record.