



Contribution ID: **160** Contribution code: **PSA-11**

Type: **Poster**

Imprint of stratosphere-troposphere-exchange on ^{10}Be deposition in Greenland and Antarctica ice cores

Monday, 21 October 2024 17:35 (20 minutes)

The ^{10}Be record from the Northern Greenland NEEM ice core has been found to significantly correlate with the mid-latitude tropopause pressure on both seasonal and annual scales, highlighting the potential of applying ice core ^{10}Be records to study the past stratosphere-troposphere exchange at mid-latitudes. However, a comprehensive study is required to determine if this relationship holds for ^{10}Be records from other ice cores in Greenland and Antarctica. In this study, we review the available high-resolution ^{10}Be records from Greenland and Antarctica over the last hundred years, finding that most of these records show significant correlations with mid-latitude tropopause pressure. However, the ^{10}Be composite records from Greenland or Antarctica could not strengthen this relationship, suggesting different transport pathways to the different ice core locations in polar region. Finally, we discuss the potential of using solar storm events as “natural experiments” to investigate past stratosphere-troposphere exchange.

Student Submission

No

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Session Classification: Poster Session A

Track Classification: Applications in Climate Studies