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# Representativeness of decadal-scale climate signals in ice-core aerosol records

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Records of past aerosol deposition to the polar ice sheets have enabled us to study variability in different parts of the earth system in great temporal detail over past glacial cycles. Furthermore, the high temporal resolution of ice-core aerosol records has been the basis for precise dating of climate records using annual layer counting. Nonetheless, the intermittent character of show deposition and especially the redistribution of snow on the surface of the ice sheet intrinsically affects the preservation of climate signals in the ice. This strongly limits how representative a climate record from a single ice core can be. It has been well established that even though seasonal variability might be preserved in an ice-core aerosol record, the inter annual variability of that record is different from a different core from the same site.

Until now most of the investigations have focused on inter annual representatives. This is mostly due to limited sample availability as multiple long records are needed for investigations on longer time scales. However, with the prospect of new high-resolution records over the Holocene from the EastGRIP ice core, understanding the representativeness of this record on decadal time scales is an important question. To tackle this problem, we use high-resolution aerosol records from multiple closely spaced ice cores from the EastGRIP deep ice core drill site. The records approximately cover the last millennium and are sub-seasonally resolved enabling the study of interannual to decadal variability over multiple aerosol species. All records are dated using annual layer counting and cross dating to the EastGRIP deep ice core using volcanic match points. In the presented pilot study, we focus on records of sea-salt and dust related aerosol species as well as on episodic aerosol signals from volcanos and wildfires.