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# A simple correlation scheme for glacial climate variability

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On a global scale, major variations in Pleistocene temperatures correlate well with glacial-interglacial changes in global ice volume, especially with ice sheet fluctuations in the northern hemisphere. On a more refined level, however, a detailed comparison between various climate records or archives requires a common time scale, which relies on the assumptions that conspicuous events of the past were time correlative. While a discharge of icebergs from the ice sheets surrounding the polar North Atlantic region directly reflects the rates of growth and decay of the ice sheet margins at sea level, it is also the result of a rapidly changing global environment which affected both regional modes in meridional ocean overturning as well as ocean-atmosphere circulation patterns. Greenland ice cores and many deep-sea sediment records from the region have demonstrated such complex interrelations between these main environmental processes for the last glaciation period (MIS 2-5d; Weichselian). In ice cores, the millennial-scale climate variabilities of the Weichselian are recognized in both hemispheres, albeit with apparently a certain time lag between the southern and northern polar regions. Comparing records of iceberg discharge from the polar and subpolar North Atlantic now reveals striking similarities on millennial time scales for both the Weichselian and the penultimate glaciation (MIS6; Saalian) during which warmer, interstadial times alternated with rather cold polar conditions. In general, cold glacial conditions in both hemispheres went along with enhanced aridity and thus atmospheric dust content due to steepened air temperature gradients between the high and low latitudes. The glacial dust records of Antarctica, which extend back in time much farther than Greenland ice records, could be used to better age constrain an interhemispheric climate comparison. A detailed study shows that such systematics holds not only for the last two glacial periods but also for older Pleistocene glaciations such as MIS 12 and 10.