

A review of the bipolar see-saw from synchronized and high resolution ice core water stable isotope records from Greenland and East Antarctica

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Abstract

Numerous ice core records are now available that cover the Last Glacial cycle both in Greenland and in Antarctica. Recent developments in coherent ice core chronologies now enable us to depict with a precision of a few centuries the relationship between climate records in Greenland and Antarctica over the millennial scale variability of the Last Glacial period. Stacks of Greenland and Antarctic water isotopic records nicely illustrate a seesaw pattern with the abrupt warming in Greenland being concomitant with the beginning of the cooling in Antarctica at the Antarctic Isotopic Maximum (AIM). In addition, from the precise estimate of chronological error bars and additional high resolution measurements performed on the EDC and TALDICE ice cores, we show that the seesaw pattern does not explain the regional variability in Antarctic records with clear two step structures occurring during the warming phase of AIM 8 and 12. Our Antarctic high resolution data also suggest possible teleconnections between changes in low latitude atmospheric circulation and Antarctic without any Greenland temperature fingerprint.