



Towards a theory of abrupt glacial climate changes

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Paleoclimate records from the last glacial cycle are punctuated by numerous abrupt changes known as Dansgaard-Oeschger (DO) and Heinrich events. The former are mainly identified as climate changes seen in the Greenland records, with ocean sediment data suggesting that they involve rapid reorganizations of the Atlantic circulation. The latter represent glaciological events, namely a massive release of icebergs into the Atlantic Ocean, but their climate signature is also clearly seen in numerous paleoclimate records. Despite their different nature, both types of events are apparently tightly coupled, with the strongest and longest DO events directly following Heinrich events, while Heinrich events occur after a series of DO events (“Bond cycle”) always during the stadial (cold) conditions in the Northern Hemisphere.

The currently available paleoclimatic data, including the new EPICA results, contain a wealth of information pointing toward the mechanism of abrupt glacial climate events, and they present serious constraints for any theory attempting to explain these. Based on these data and on climate modelling experiments, we will present an attempt to formulate a unified theory of abrupt glacial climate changes.