



## **The stability of the AMOC in the Last Glacial Maximum climate**

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Meltwater pulses are thought to have weakened the Atlantic Meridional Overturning Circulation (AMOC) at regular time intervals during the last glacial. For example, during Heinrich event H1 the AMOC was nearly eliminated during ca. 2000 yrs, to recover sharply afterwards. The stability of the glacial AMOC is examined using a coupled model of intermediate complexity. We generate two glacial states which have comparable climates, but differ in the direction of the overturning freshwater transport at the southern boundary of the Atlantic basin so that the two states differ in their stability characteristics. We examine the differences in the AMOC response to freshwater pulses and the mechanisms that control these responses. One state always collapses permanently. For the other glacial state the circulation is still more easily perturbed than its modern counterpart, but it always recovers. Restoring timescales are considerably longer than for the modern climate, while recovery only sets in well after termination of an imposed freshwater pulse. Such a temporal pattern much better matches reconstructed Heinrich events than the rapid resumption usually simulated for the modern climate.