



## **Surface wind-stress threshold for glacial Atlantic overturning**

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Using a coupled model of intermediate complexity the sensitivity of the last glacial maximum (LGM) Atlantic meridional overturning circulation (AMOC) to the strength of surface wind-stress is investigated. A threshold is found below which North Atlantic deep water formation takes place south of Greenland and the AMOC is relatively weak. Above this threshold, deep water formation occurs north of the Greenland-Scotland ridge, leading to a vigorous AMOC. This nonlinear behaviour is explained through enhanced salt transport by the wind-driven gyre circulation and the overturning itself. Both pattern and magnitude of the Nordic Sea's temperature difference between strong and weak AMOC states are consistent with those reconstructed for abrupt climate changes of the last glacial period. Our results thus point to a potentially relevant role of surface winds in these phenomena.