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Observation of alpha-stable noise in an ice-core record

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Rapid climate fluctuations are observed in ice- and sediment cores during the last glacial period. The dynamics of the transitions into these interstadials can be modelled through the analysis of a very high resolution record of dust in the GRIP ice-core from central Greenland. The data suggests a noise driven transition between two states in a bistable climate potential. This observed potential probably describes two states of the oceanic circulation in the North-atlantic. The driving noise is a strongly non-gaussian white-noise, describing the fast atmospheric and oceanic climate components forcing on the oceanic circulation. The noise is observed to be α-stable, with $\alpha \approx 1.7$. The structure of the driving climate noise has strong implications for the dynamics and for predictability of the climate.