



## **Continuous air isotopic measurements over MIS 4 and 5 in the NorthGRIP ice core (Greenland): new constraints on the sequences of Dansgaard-Oeschger (DO) events and links with environmental changes.**

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The increasing number of high resolution records of the last glacial cycle from continental, marine and ice archives permits to document the large variability of the shape and amplitude of DO events at different latitudes. Here, we focus on Greenland ice core records over a period with relatively small ice-sheets, Marine Isotopic Stages 4 and 5. Using the combination of nitrogen and argon isotopic measurements of the air trapped in the ice over DO 18 to 24, a model of thermal and gravitational firn fractionation as well as the constraints given by the water stable isotopes records, we produce a continuous temperature record over this period. We evidence strong differences in the amplitude of Greenland temperature for the different DO events. Such differences are not related to the difference in amplitude of lower latitude climatic records, thus highlighting the specificity of the Greenlandic region (as an example, while DO 21 is associated with a strong signal in many low latitudes continental records, the Greenland temperature signal is relatively small). Then, we present the first high resolution record of oxygen isotopes of the air over this period. Rapid excursions of  $\delta^{18}\text{O}_{\text{atm}}$  by

0.2 per mil in less than 1000 years are evidenced over some DO. These rapid changes most likely arise from changes in relative humidity or latitudinal repartition of vegetation changes. Thus we can use our  $\delta^{15}\text{N}$  and  $\delta^{18}\text{O}_{\text{atm}}$  records to constrain the phase relationship between the changes in Greenland temperature and in continental land surfaces in the lower latitude over the sequence of DO events.