



The total air content in the NGRIP ice core from 120 to 10 kyr BP.

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With a melt-refreezing technique we measured the concentration of methane (CH_4) and nitrous oxide (N_2O) of the enclosed air along the ice core of the North Greenland Ice Core Project (NGRIP). A valuable byproduct of those measurements is an estimation of the total air content (TAC). The total air content depends, among others, on altitude, surface temperature, close off depth and insolation parameters.

Due to unknown temperatures in some parts of the measuring system, our TAC raw data have been calibrated to additional measurements with an uncertainty of 0.5 ml/kg.

Here we present a large dataset of 2323 new TAC data points from NGRIP. Our results cover the time interval from 120 to 10 kyr BP (3082 to 1481 m depth) and the TAC values vary between 75 to 105 ml/kg at standard temperature and pressure (STP).

We compare the data to other available proxies such as dust and $\delta^{18}\text{O}$, measured on the ice core, and to the summer insolation at the core location. We find the insolation to be imprinted in the TAC record, supporting previous TAC studies. Interestingly, for some of the millennial scale variations known as Dansgaard Oeschger (DO) events, a corresponding signal in the TAC can be observed. Our analysis will provide further information on potential drivers of TAC changes.