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## Total Air Content measurements from the RECAP core

### Content

Total air content (TAC) from ice cores is principally reflecting air pressure when the air is occluded and is therefore a proxy for elevation. However, there are a number of complications i.e. melt, changes in firn structure, and atmospheric pressure variability. We measured TAC in the RECAP ice core drilled in 2015 on the Renland ice cap situated in East Greenland at presently 2340 m altitude. The top 529 m of the 584 m core cover the Holocene. There is extensive melt in that section of the core reflected in low air content values. Assuming constant elevation and air pressure, lower TAC at the beginning of the Holocene indicate more melt and therefore higher summer temperatures. Simulations with the regional climate model HIRHAM5 allow us to translate the observed melt fractions into summer temperatures. We conclude that summer temperatures were ~2 to 3°C warmer than at present in the early Holocene in accord with previous finding in Greenland. The ~22m of glacial ice in RECAP covering 11.7 to 119 kyr BP seem unaffected by melt. However, we observe rapid changes in TAC that cannot originate from elevation changes. They may originate from dynamical effects during rapid climate change events.

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