Contribution ID: **65** Type: **Poster**

Using Distributed Temperature Sensing to measure borehole temperature.

Tuesday 1 October 2019 17:48 (4 minutes)

A fibre-optic Distributed Temperature Sensing (DTS) instrument has been deployed into a number of ice boreholes in order to measure the temperature profile. The advantage of the DTS is that glass in the fibre itself becomes the temperature sensor and a relatively cheap length of fibre-optic cable can be used to measure temperature continuously along its length. As temperatures are measured throughout the cable's length, cables can be frozen in place and true undisturbed temperatures obtained. We describe the weaknesses of the of-the-shelf DTS instrument used and ways to overcome them. A method is described in order to obtain well calibrated borehole temperatures. Using this method we present borehole temperature profiles from the TALDICE, Little Dome C and Skytrain Ice Rise boreholes.

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Session Classification: Session 4