



## **Direct Burial Broadband Seismic Instrumentation that are Rugged and Tilt Tolerant for Polar Environments**

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The integrated broadband Meridian Posthole and Compact seismic systems have been engineered and tested for extreme polar environments. Ten percent of the Earth's surface is covered in glacial ice and the dynamics of these environments is a strategic concern for all. The development for these systems was driven by researchers needing to densify observations in ice covered regions with difficult and limited logistics. Funding from an NSF MRI award, GEOICE and investment from the vendor enabled researchers to write the specifications for a hybrid family of instruments that can operate at -55C autonomously with very little power, 1 watt for the Meridian Compact system and 1.5 watts for the Meridian 120PH. Tilt tolerance in unstable ice conditions was a concern and these instruments have a range of up to +/-5 degrees. The form factor, extreme temperature tolerance and power load of the instruments has reduced the bulk of a complete station by 1/2 and simplified installation greatly allowing more instruments to be deployed with limited support and a lighter logistical load. These systems are being tested in the Antarctic at SouthPole Station and McMurdo for the second year and the investment has encouraged other instrument and power system vendors to offer polar rated equipment including telemetry for ancillary support.