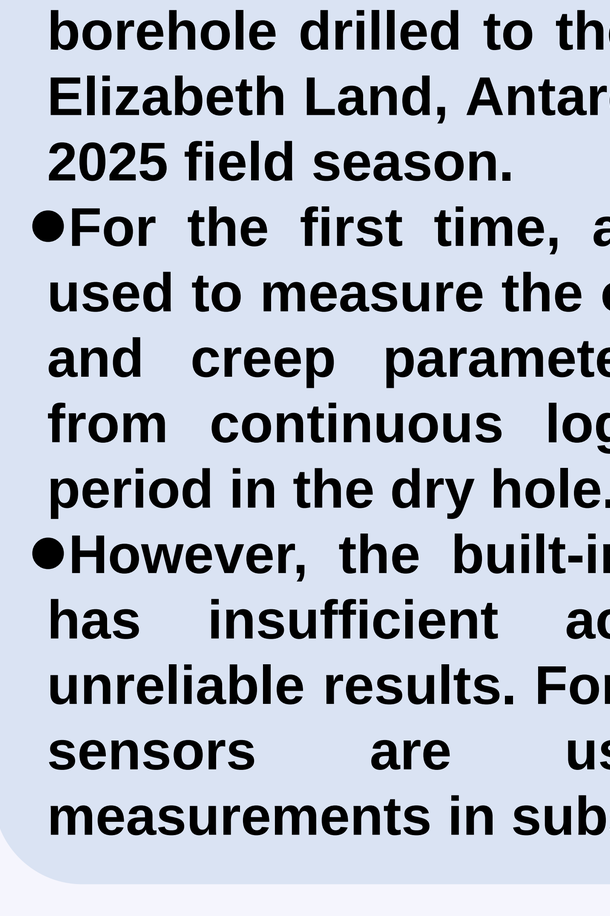
LOGGING TOOL-BASED CHARACTERIZATION OF A BEDROCK BOREHOLE IN EAST ANTARCTICA'S PRINCESS ELIZABETH LAND

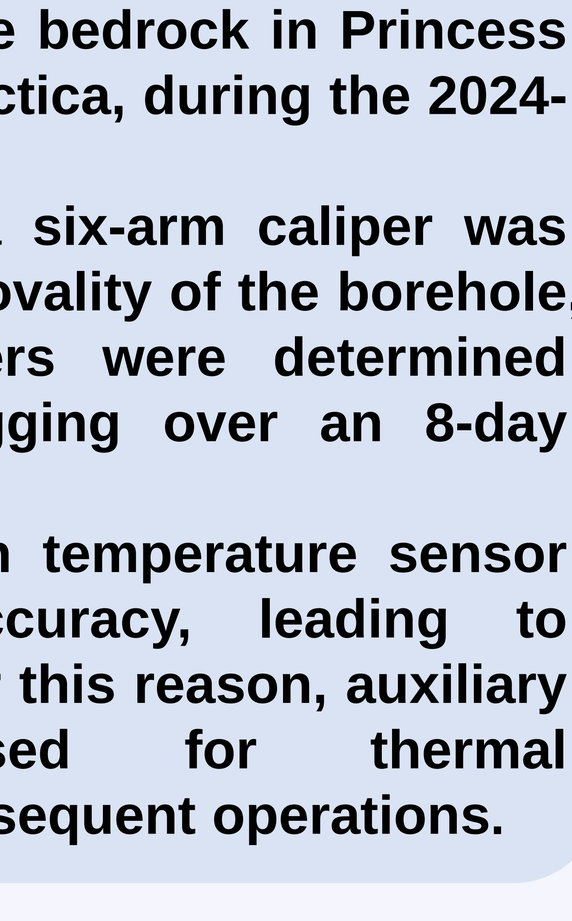
Bo Han , Nan Zhang, Yazhou Li , Pavel Talalay, Xiaopeng Fan, Da Gong

Polar Research Center, Jilin University, Changchun, China

- To obtain precise logs from ice boreholes, Jilin University has developed a high-precision logging system that can measure borehole diameter, azimuth, inclination, temperature, and pressure in real time.
- The logger comprises of an upper anti-torque, an inclinometer assembly, a caliper assembly, a lower anti-torque device, and a temperature measurement assembly.
- The logger was tested in a 540-m-deep borehole drilled to the bedrock in Princess Elizabeth Land, Antarctica, during the 2024-2025 field season.
- For the first time, a six-arm caliper was used to measure the ovality of the borehole, and creep parameters were determined from continuous logging over an 8-day period in the dry hole.
- However, the built-in temperature sensor has insufficient accuracy, leading to unreliable results. For this reason, auxiliary sensors are used for thermal measurements in subsequent operations.



Overview of the logger



On-site operations