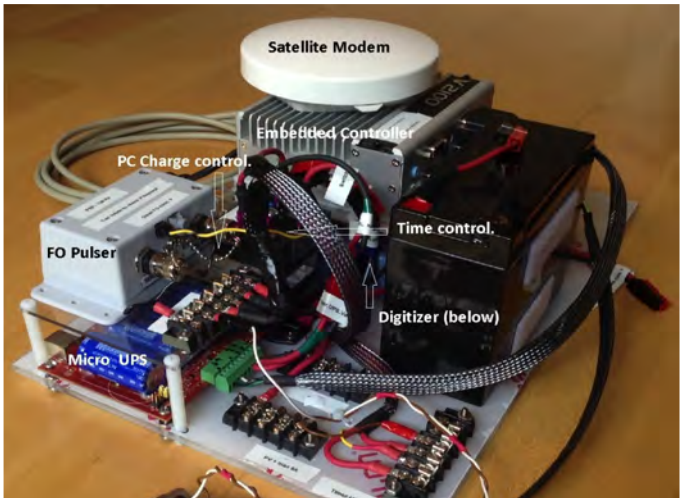
SEEING INTO THE ICE WITH RADIO WAVES

SFU GLACIOLOGY



Glacier ice is nearly transparent to radio waves, but water, rock and sediment are not. Novel autonomous radar systems are allowing us to monitor what goes on in and under the ice.

WHAT HAPPENS INSIDE A GLACIER OVER THE COURSE OF A MONTH OR A YEAR?

"Radio-echo sounding" has long been used to determine glacier depth in mapping surveys. Similar technology is now being applied to monitor changes in glacier properties over time.

Blue System Integration Ltd. (a Vancouver-based company) has been collaborating with researchers from Simon Fraser and Carleton Universities to develop the first autonomous stationary ice-penetrating radar systems suitable for long-term deployment in both Arctic and temperate environments.

Four of these systems were deployed over three summers on the Kaskawulsh Glacier and operated autonomously for up to 77 days. Another system operated for about a year on an ice island in the Canadian Arctic.

These radar systems detected dramatic changes in water storage within the Kaskawulsh Glacier associated with the filling and drainage of an ice-dammed lake, and changes in thickness of the ice island due to surface and bottom melting.

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For more information: contact Laurent Mingo of Blue System Integration Ltd (http://www.bluesystem.ca/ice-penetrating-radar.html) or Gwenn Flowers (gflowers@sfu.ca) or visit www.sfu.ca/~gflowers/.

Full reference: Mingo, L., G.E. Flowers, A.J. Crawford, D.R. Mueller, D.G. Bigelow. 2020. A stationary impulse-radar system for autonomous deployment in cold and temperate environments, *Annals of Glaciology*.