

PRELIMINARY RESULTS OF CREVASSE DETECTION
EXPERIMENT IN THE ANTARCTIC
BY SHORT PULSE RADAR (ABSTRACT)

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A preliminary crevasse detection experiment by short pulse radar was carried out in the crevasse area about 300 m north of Tottuki Point on the Antarctic ice sheet during the 32nd Japanese Antarctic Research Expedition. The final objective of this experiment is to develop practical crevasse detection radar for the safe movement of snowmobiles in the Antarctic, especially under condition of whiteout and blizzard. The C-band (4.3 GHz) radar used in the experiment has a capability to obtain high range resolution (about 8.8 cm in ice) with short pulse length (1 ns). A parabolic antenna with beam width of 5.6° on the snowmobile was scanned over the ice surface, changing azimuth and incidence angles. Crevasse from 1 to 3 m wide were observed in this experiment. Both open crevasses and snow covered crevasses (hidden crevasses) were observed. Echoes of radiowaves which penetrated into the ice sheet and were reflected by the crevasse wall, were clearly observed. These experimental results showed that the radar system can successfully detect both open crevasses and hidden crevasses.

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