

The simulation is based on the following assumptions. 1) We have used temperature and density distribution within the ice sheet model with reference to measured and theoretical values near Syowa Station. 2) There are no cracks within the ice sheet. 3) We have considered a meteorite with one meter radius and a rock of a globular or a plane shape. 4) The dielectric constant of meteorite is approximated to the value of a medium-dry ground according to the CCIR data. 5) The antenna, set up one meter above the ground, has a gain of 8 dB. 6) The radar range used in the analysis is every 50 m within the ice sheet.

As a result, we have succeeded in developing the program for simulation of the probing radar echo. This paper explains the relation between the gain of receiving system or the shape of reflective matter and the probing ability.

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BOTTOM TOPOGRAPHY AND INTERNAL LAYERS IN EAST QUEEN MAUD LAND, EAST ANTARCTICA FROM 179 MHZ RADIO ECHO-SOUNDING (ABSTRACT)

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Extensive echo-sounding has been conducted in East Queen Maud Land during the 1984 field season. A 179-MHz radar with separate transmitting and receiving antenna was equipped and the echoes were recorded in a digital system to detect minute reflections. The results revealed the cross-sections of the ice sheet along traverse routes from 69° to 75°S. Detailed observations on the ground at Mizuho Station have shown the elliptical polarization in internal reflected echoes observed when two antennas, kept in parallel with each other, were rotated horizontally. The internal echoes were most clearly distinguished when the antenna azimuth was oriented perpendicular to the flow line of the ice sheet. The internal echoes of high reflection coefficient were detected at the depths of 500–700 m and 1000–1500 m at Mizuho Station. Since a distinct internal echo at the 500-m depth coincides in depth with a 5 cm thick volcanic ash-laden ice found in the 700 m ice core taken near the observation site, these echoes may correspond to the acidic ice layers formed by the past volcanic events in East Queen Maud Land.

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