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ABSTRACTS OF PAPERS ACCEPTED FOR THE SYMPOSIUM BUT NOT PRESENTED

ON SOME ASPECTS OF THE INTERACTION OF THE PULSE AND THE MEDIUM DURING THE VERTICAL ECHO SOUNDING OF GLACIERS

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Abstract. The paper discusses three aspects of the interaction of a radar pulse and the medium which is being sounded, that is the glacier proper and the lower scattering surface. These aspects are:

1. Radar signals attenuation during vertical sounding.
2. The rate of radar signal propagation through the glacier.
3. Fluctuations of radar signals during horizontal movements.

Representative samples of signal attenuation were chosen for two points in the vicinity of Mirny station in Antarctica, these samples were obtained under roughly constant temperature conditions of the ice. The scattering properties of the bedrock are shown to be the controlling factor. Histograms of attenuation for these two points are given; effective temperatures of the ice were estimated.

The measurements of the propagation velocity of electromagnetic waves were made along paths near "Molodezhnaya" station. Interesting results were obtained. The curves of the variation of the amplitude of reflected pulses were obtained for a number of short-distance paths with the radar moving horizontally, the working radar frequencies were 60, 213 and 440 MHz. Radii of autocorrelation of signal fluctuations were estimated. The fluctuation pattern along each of the paths is shown to be stable in time provided the distance is short enough. Measurement of the surface velocity of ice sheet movement by the transition of the fluctuation pattern in time seems quite promising.

POLARIZATION CHANGES OF RADIO SIGNALS IN VERTICAL RADIO-ECHO SOUNDING OF GLACIERS

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Abstract. An electromagnetic linearly-polarized signal transmitted through the glacier in a vertical direction, reflected from the bedrock, and received with a receiving antenna, is found to be changed into one either partially or elliptically polarized. The polarization changes are believed to be due mainly to the crystal structure of the glacier and anisotropy caused by the pressure of the upper layers.