MEASUREMENT METHOD OF TEMPERATURE DISTRIBUTION BY RADAR ECHO WITHIN THE ICE SHEET OF THE ANTARCTIC CONTINENT (ABSTRACT)

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The picture processing based on a correlation method for radar echo has been used in meteorological observation, traffic control, probing, and so forth.

But in recent years, a more accurate measurement method is required, for the following purposes: 1) Measurement of precipitation rate and determination of the kind of precipitation that are needed for analysis of the electro-magnetic wave propagation. 2) Measurement of temperature distribution within the ice sheet of the Antarctic Continent. 3) Measurement of the concentration of air pollution, and size distribution of pollutants, and determinations of the kind of pollution. 4) Probing of meteorites within the ice sheet of the Antarctic Continent. 5) Measurements of the pollution at the sea surface, the height of sea waves, the temperature of the sea surface, the water content of soil and the water vapor content of the atmosphere. 6) Other measurements.

The important factor in this analysis, is the dielectric constant within the ice sheet influencing attenuation and reflection coefficients which are related to depth, temperature and density of the ice sheet. So, we have assumed the density profile equivalent in character to Site II data, and calculated the temperature profile of the ice sheet using the radar echo. It has been revealed that the analysis with the radar echo of only one frequency cannot lead to a general solution, and that in order to obtain the temperature profile we need to know the surface temperature of the ice sheet. The present paper discusses the measurement method with active radar echo for the purpose of 2). In this case, the radar echo have contained some parameters (the density, the dielectric constant and the wave length).

So, the analysis with radar echo of two frequencies cannot always lead to the general solution, but the case of three frequencies can lead to the general solution with no assumption.

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A PROBING RADAR DESIGNED FOR SIMULATION OF RADAR ECHO OF A METEORITE WITHIN THE ICE SHEET OF THE ANTARCTIC CONTINENT (I) (ABSTRACT)

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We have simulated echoes from meteorite by means of a probing radar. Its purpose is to probe meteorites within the ice sheet of the Antarctic Continent.