RADIOWAVE MODEL OF SUBSURFACE LAYERS AND METHOD OF MODEL STATUSE OF DESCRIPTION

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The modern methods of physical monitoring of the subsurface layers, used with the purpose of definition of the physical status are based oh the rating of complex dielectric permeability (ε^*) and by electric conductivity (σ) in wide range of electromagnetic radiation wave lengths. The wave methods are usually used for monitoring of subsurface layers, based on registration of various penetrating and the antenna sensing of response from layers by wave impact. The dynamic of changes in spatial and temporary distribution ε^* and σ is determined by action of various external climatic and technology factors by the electromagnetic response from layers. The methods of wave diagnostics of subsurface layers used ultra-wideband signals, has the greater efficiency and accuracy of status rating of physical and chemical properties, and moisture characteristics of ground layers in the high areas.

In the paper it is shown that the laws of changes in electrodynamic parameters of ground at influence of the various factors in satisfactory accuracy in wide frequency band can be described by the formulas of theory percolation. This theory determine the frequency and temperature relaxation of dielectric characteristics of free water, dispersions of dielectric permeability of ground in the field of low frequencies and other processes caused by influence of moisture, temperature, soling, density etc. The distributions of electrodynamic parameters of layers by influence of the climatic and weather factors has non-stationary character and are determined in dependence by the specified parameters of moisture and temperature. It distributions for researched object are from the decision of the heat-moisture equations for the capillary and porous layers.

The presence algorithm of distribution of dielectric permeability and conductivity in depth of layers as grounds by results of sounding by ultra-wideband signals and in terms of proceeding in them heat, moisture processes are offered. It is shown, that the similar approach in interpretation of these results allows increase of the reliability and accuracy in the layers control and diagnostics, and also location of objects in the ground. The results of numerical modeling of dielectric permeability and electroconductivity distribution in natural layers in wide temperature and frequency range for different values of moisture are described.