

Pulse inductive electric prospecting with the moving sensors in solving engineering and hydrogeological problems under urban conditions

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Measurements of electric induction signals from the medium under studies using mobile antennas cut significantly the time required to detect a target. Survey in motion with a controlled electromagnetic source suggests continuous registration of spatial-temporal exposures of the diffusion transient process. The developed mobile technology uses a base spectrum frequency lower than that in GPR, and so is less dependent on higher medium conduction and near-surface inhomogeneities.

Superhigh spatial-temporal density of experimental data along the scanning path makes it possible to get stable quasitomographic images of the medium under investigation. The procedure of splitting the field into normal and abnormal components on the basis of three-dimensional mathematical modeling is an important aspect of the image formation. In this case a reference model of a host medium is considered as a superposition of two components. One component is a normal field described with a medium being axially symmetrical about a source, the other is its three-dimensional aspect. A synthetic electromagnetic image obtained by means of minimizing procedures and a reference model allows one to present the basic morphological and electrophysical parameters of targets quite well.

Significant factual evidence on the application of electromagnetic scanning of a near-surface layer has been accumulated. To carry out field surveys the scanning equipment of the "Impuls-Avto" and "Impuls-SL"-types developed in the institute in automobile and foot configurations is used.