

Archaeological object detection via time domain electromagnetic sounding

Slepak Z., Ziganshin E.

Kazan Federal University, 420008, Kremlevskaya 18, Kazan, Russia

Abstract

This paper discusses the results of archaeological object detection and study using the time domain electromagnetic system Impulse-auto M-1/0-20. This system registers transient response at super-short times, which allows electromagnetic sounding of the uppermost layers of geological section. Sounding results are presented in the form of electrical conductivity $S(H)$ cross sections along the profiles and constant-value surfaces identified with lithologic and stratigraphic boundaries. Electromagnetic wave propagation distance serves as an indicator for the presence or absence of archaeological objects in cultural layer. Absolute heights of survey benchmarks provide the opportunity to present the $S(H)$ constant-value surfaces in meters, use drilling data for reliability control and provide recommendations for archaeological excavations [2-4]. Combination of geophysical and archaeological methods creates the opportunity to carry out additional geophysical measurements and improve overall performance greatly [1, 3]. Great efficiency and effectiveness of time domain electromagnetic sounding is shown by a concrete example of determining the depth of buried and preserved ancient ruins, delineating the cultural layer and archaeological dating of several formations.
