Geophysical Research Abstracts, Vol. 7, 05597, 2005
SRef-ID: 1607-7962/gra/EGU05-A-05597

The exploration of waste sites by means of geoelectric and seismic methods

K. Baracza (1), Á. Gyulai (2), T. Ormos (3), I. Szabó (4), E. Turai (5) and M. Dobróka (6)

(1) Department of Geophysics, University of Miskolc, Hungary (gfkrixi@gold.uni-miskolc.hu), (2) Department of Geophysics, University of Miskolc, Hungary (gfgyulai@gold.uni-miskolc.hu), (3) Department of Geophysics, University of Miskolc, Hungary (gformos@gold.uni-miskolc.hu), (4) Department of Geophysics, University of Miskolc, Hungary (gflouis@uni-miskolc.hu), (5) Department of Geophysics, University of Miskolc, Hungary (gfturai@gold.uni-miskolc.hu), (6) Department of Geophysics, University of Miskolc, Hungary (dobroka@gf02.gold.uni-miskolc.hu)

Near surface structures are often investigated by means of DC geoelectric and refraction seismic methods. The independent use of these methods often leads to inherent difficulties. As is well-known the non-uniqueness and ambiguity problems can sufficiently be reduced by joint inversion. In the paper it is demonstrated that the accuracy and reliability of the interpretation of DC measurement data can appreciably be increased by integrating refraction seismic data into the procedure. In the inversion of DC geoelectric the series expansion method is used with exact (FD) and approximate (locally 1D) forward modelling. A comparison of the two algorithms is presented. In order to increase the computation speed we developed a special refraction seismic forward modelling algorithm based also on a series expansion of the model parameters.

In our discussion both the lateral extension and the vertical structure (including the continuity of insulating layer) of the waste site is investigated. The reliability and accuracy of the (joint) inversion method is tested by using synthetic data. Some case-histories of Hungarian waste sites are also presented.

This research work was supported by the National Science Research Fund of Hungary (projects T 037842, T042686 and T 046765), the authors are grateful for the support.