



## **Smoothing of geoelectrical resistivity profiles in order to build a 3D model: A case study from an outcropping limestone block**

Krisztina Tóth (1) and Gábor Kovács (1,2)

(1) Department of Geophysics and Space Sciences, Eötvös Loránd University, Budapest, Hungary (krisztaaa.t.91@gmail.com), (2) Department of Geology, University of West Hungary, Szombathely, Hungary

Geoelectrical imaging is one of the most common survey methods in the field of shallow geophysics. In order to get information from the subsurface electric current is induced into the ground.

In our summer camp organized by the Department of Geophysics and Space Sciences, Eötvös Loránd University we have carried out resistivity surveys to get more accurate information about the lithology of the Dorog basin located in the Transdanubian range, Middle Hungary.

This study focused on the outcropping limestone block located next to the village Leányvár in the Dorog basin. The main aim of the research is the impoundment of the subsurface continuation of the limestone outcrop.

Cable problems occurred during field survey therefore the dataset obtained by the measurement have become very noisy thus we had to gain smoothed data with the appropriate editing steps. The goal was to produce an optimized model to demonstrate the reality beneath the subsurface.

In order to achieve better results from the noisy dataset we changed some parameters based on the description of the program. Whereas cable problems occurred we exterminated the bad datum points visually and statistically as well. Because of the noisiness we increased the value of the so called damping factor which is a variable parameter in the equation used by the inversion routine responsible for smoothing the data. The limitation of the range of model resistivity values based on our knowledge about geological environment was also necessary in order to avoid physically unrealistic results.

The purpose of the modification was to obtain smoothed and more interpretable geoelectric profiles. The geological background combined with the explanation of the profiles gave us the approximate location of the block. In the final step of the research we created a 3D model with proper location and smoothed resistivity data included.

This study was supported by the Hungarian Scientific Research Fund (OTKA NK83400) and was realized in the frames of TÁMOP 4.2.4.A/2-11-1-2012-0001 high priority "National Excellence Program - Elaborating and Operating an Inland Student and Researcher Personal Support System convergence program" project's scholarship support.