



## **Resistor network as a model of fractures in granitic rocks – model for ERT interpretation in crystalline rocks**

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Recently we have developed and tested system for long-term monitoring of underground excavation stability in granitic rocks. It is based on repeated ultrasonic time-of-flight measurement and electrical resistivity tomography (ERT) measurement. The ERT measurement is performed directly on the rock wall using 48 electrodes. The spacing between electrodes was selected 20 centimeters. Based on sensitivity function it can be expected that maximum penetration depth of ERT is about 1.5 m.

The observed time changes in apparent resistivity are expected to be mainly result of changes in fracture water saturation.

To get some basic knowledge about relation between electrical resistivity in the rock fracture zone and its saturation a series of laboratory tests with rock samples with different porosity and different saturation was performed.

The model of crystalline rock with sparse net of fractures is highly inhomogeneous medium and can be hardly considered as 2D layered model, which is usually used in ERT inversion. Therefore, we prepared resistor-network model for the qualitative/quantitative interpretation of observed apparent resistivity changes. Some preliminary results of our experience with this new type of resistivity model are presented.

The results can be used for underground storage monitoring projects.

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