

## Rock Thickness Measurement by Using Self-Excited Acoustical System

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**Abstract :** The knowledge about rock layers thickness, especially above drilled mining pavements are crucial for workers safety. The measuring systems used nowadays are generally imperfect and there is a strong demand for improvement. The application of a new type of a measurement system called Self-Excited Acoustical System is presented in the paper. The system was applied until now to monitor stress changes in metal and concrete constructions. The change in measurement methodology resulted in possibility of measuring the thickness of the rocks above the tunnels as well as thickness of a singular rock layer. The idea is to find two resonance frequencies of the self-excited system, which consists of a vibration exciter and vibration receiver placed at a distance, which are coupled with a proper power amplifier, and which operate in a closed loop with a positive feedback. The resonance with the higher amplitude determines thickness of the whole rock, whereas the lower amplitude resonance indicates thickness of a singular layer. The results of the laboratory tests conducted on a group of different rock materials are also presented.

**Keywords :** auto-oscillator, non-destructive testing, rock thickness measurement, geotechnic

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