

KGHM S.A.

The seismic shock prediction algorithm based on the rock mass behaviour data

Project description for ESGI144

Background

KGHM S.A. exploits copper ore deposits in underground mining facilities. As a result of this operation the seismic activity of the rock mass is induced. One of the symptoms of seismic activity of the rock mass is the occurrence of high-energy seismic shocks. These phenomena can lead to severe destructions in mine workings. Resulting from that is a threat to work safety in the area of seismic shock occurrence and risk of damage to mine's property. Particularly strong seismic shocks may also pose a threat to objects on the surface. The level of seismic activity of the rock mass depends on many factors that can be divided into:

- factors related to the environment in which the operation is carried out,
- factors related to methods of conducting the operation.

The problem

Primary objective: Create an algorithm for prediction of the occurrence of seismic shocks with a given energy.

Secondary objective: Based on the above algorithm, create a method for selection of operating parameters (blasting, ...) leading e.g. to provoking (approaching and unavoidable seismic phenomena) in a given time.

Data availability

The model can be based on:

- data from rock mass activity measurements collected by mine services
- data regarding conditions in the area of exploitation (geology, direction of exploitation, proximity of exploited areas),
- data related to the exploitation (geometry of workings, progress of exploitation front, blasting, ...).