



Contribution ID: 156

Type: poster

Radar Monitoring –Modelling of Undeclared Activities

Wednesday, 22 October 2014 11:50 (40 minutes)

A feasibility study in the framework of the German Support Programme investigates the applicability of the 3D radar method for the monitoring of a geological repository. The aim of technical solution is the detection and localisation of clandestine underground mining activities. The radar system should form a kind of protective shield around a repository to detect and localise possible activities in an early stage and in a sufficient distance.

To date radar monitoring in the context of geotechnical engineering is restricted to few applications, mainly in form of repetitive linear measurements. Repetitive surveys out of boreholes or drifts are conducted with disadvantages concerning safeguards requirements as high maintenance and positioning inaccuracies. In this study a static radar system is selected to omit these disadvantages. A monitoring system consisting of an array of static radar probes could probably be realized as a highly accurate, durable and low-maintenance automatic early warning system.

In the past decade DMT has developed an unique 3D borehole radar used for the exploration in salt mines, at cavern sites and in limestone quarries. The knowledge of DMT can be used for a further development of a direction sensitive radar monitoring system. With the additional information of the direction, possible activities in the mine could not only be detected but also localised in 3D space.

The detectability of different possible clandestine mining activities is investigated by simulations of radar wave propagation. The simulations involve the influence of baseline conditions and known activities to the data. The detectability of mining activities is analysed by comparing different geometries of the activities, different layouts of the radar probes and accounts for different probe parameters.

Country or International Organization

Germany

Primary author: UCHTMANN, Sven (DMT GmbH & Co. KG)

Co-author: ORLOWSKY, Dirk (DMT GmbH & Co. KG)

Presenter: UCHTMANN, Sven (DMT GmbH & Co. KG)

Session Classification: Safeguards Needs at Geological Repositories and Encapsulation Facilities: E-Posters