

EGU21-230, updated on 20 Oct 2021

<https://doi.org/10.5194/egusphere-egu21-230>

EGU General Assembly 2021

© Author(s) 2021. This work is distributed under the Creative Commons Attribution 4.0 License.



Stability analysis of the surrounding rock of cavern under extreme situation based on limited borehole data.

Long Tan and Wei Xiang

China University of Geosciences, Faculty of Engineering, China (tanlong22@hotmail.com)

In the pre-feasibility study stage, only a small amount of borehole data can be obtained. Since the available geological information is insufficient, the engineering geological conditions of the project can only be preliminarily and approximately estimated during this stage. In this study, we attempt to seek a method to make a preliminary analysis and evaluation of the stability of the surrounding rock masses of an underground rock cavern project, which makes full and optimum use of the limited borehole data to accomplish the assessment of the investigated site. The basic information on rock fractures is extracted from the borehole Television logging data and the fracture extension directions are also determined. Providing that the cracks detected in the borehole would extend to the cavern area, the cracks with appropriate direction, larger width and larger hydraulic conductivity can be selected. These selected cracks are considered in the numerical model established using ANSYS, and the stability of surrounding rock of cavern is analyzed under this situation. In the absence of large amount of borehole data, this method, which set up an extreme case, can be used to analyze possible failure of rock mass under extreme adverse conduction in advance. In general, the proposed method for stability analysis could contribute to the design and construction practice of a tunnel project constructed in fractured rock masses.