

Workshop Proposal for ISRM 2023 – Salzburg / Austria
Topic: Numerical Modeling Assisted Risk Quantification in Rock Masses

Subject: The workshop aims to build grounds for open discussion on building an agile framework for introducing parametric uncertainty in performance assessment of rock slopes or underground openings through numerical modelling. The perspective is to be presented focusing on the current state of art in conventional design procedures, including the ones not necessarily being outlined by codes and regulations. The discussion will begin by presenting basic concepts of probability and distribution of random variables; which are to be defined within the context of input parameters for limit equilibrium and/or finite element-based analyses. A special emphasis will be given to discuss the methods for site characterization and testing, and implications on parameter estimation. The discussions will be kept restricted to problems which can be characterized through limited deformation concepts. Typical methods for quantifying parameter uncertainty in terms of basic strength stiffness and other fundamental inputs as well as external loading-based uncertainty will be discussed, in the light of practical problems. External loading-based scenarios will be discussed in the light of presence of pore water within rock joint systems as well as uncertainty (both aleatory and epistemic) in dynamic loading parameters, i.e. earthquakes. The examples will be presented in an order of increasing complexity, coupled with discussions on case specific sensitivity of key input parameters. The discussion will evolve towards how to properly quantify risk definitions; specific to each case study and generating a well communicated technical output by geoenvironmental engineers for the benefit of the community.

The workshop is open to contribution from all participants of experience and interest in geomechanics and is designed to flow in a thought-provoking style.

Discussed subtopics will be supported by 2D numerical analyses, within an interactive framework augmented by participant feedback. Soft copies of numerical models will be shared with audience who have enrolled to the event, prior to the session.

Total duration of the event is planned as 2 to 2.5 hours with a single 15-minute break defined halfway.

Presenter: Assigned expert(s) from Geodestek Ltd. Şti. and Rocscience Inc.

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