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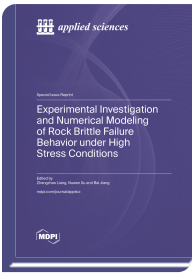
Special Issue Reprint

Experimental Investigation and Numerical Modeling of Rock Brittle Failure Behavior under High Stress Conditions



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With the implementation of relevant strategies such as the Western Development, major national infrastructure construction is being carried out at an unprecedented speed in China. The failure mechanism and mechanical behavior of rock masses in high-stress environments are extremely complex and diverse. They have a significant impact on the design, evaluation, and operation of deep rock mass engineering. This research topic aims to highlight the influence of high stress on the failure behaviors and mechanical properties of brittle rock under high stress. The seepage characteristics, failure mechanism and mechanical properties of rock mass at various sizes, e.g., micro-, meso-, macro and engineering sizes, under statics dynamics, seepage and high-temperature conditions were investigated. Additionally, CT scanning technology, low-field nuclear magnetic resonance, scanning electron microscopy, physical experiments, numerical simulations, the back analysis method and other methods were applied. The failure process, failure characteristics, instability mechanism and deformation behavior of rock mass (engineering) were comprehensively compared and analyzed. By reading this reprint, one can gain a comprehensive and in-depth understanding of rock brittle failure behavior under high-stress conditions. It is of great significance to perform a stability evaluation of rock engineering practices, such as underground excavation, shale gas production, and deep tunnel

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