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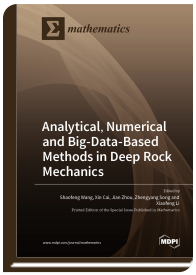
Special Issue Reprint

Analytical, Numerical and Big-Data-Based Methods in Deep Rock Mechanics



www.mdpi.com/books/reprint/6566

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ISBN 978-3-0365-5761-8 (Hardback)
ISBN 978-3-0365-5762-5 (PDF)

With the increasing requirements for energy, resources, and space, numerous rock engineering projects (e.g., mining, tunnelling, underground storage, and geothermal and petroleum engineering) are more often being constructed and operated in large-scale, deep underground, and complex geology environments. Meanwhile, more and more unconventional rock failures and rock instabilities (e.g., rockbursts, large-scale collapses, and mine earthquakes) are occurring and severely threatening the safety of underground operations. It is well-recognized that rocks have multiscale structures from minerals, particles, fractures, fissures, joints, and stratification to faults and involve multiscale fracture processes. In the deep earth, rocks are commonly subjected to complex high-stress and strong-dynamic disturbances simultaneously. In addition, there are many multiphysics coupling processes, such as the coupled thermo-hydromechanical interaction in fractured porous rocks. It is still difficult to understand rock mechanics and to characterize rock behaviors with complex stress conditions, multiphysics processes, and multiscale changes. The primary aim of this Special Issue is to bring together original research discussing innovative efforts on analytical, numerical, and big-data-based methods in rock mechanics. It includes 25 manuscripts that illustrate the richness and challenging nature of deep rock

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