

Contents

Preface	ix
Mechanical Properties of Rock and its Analysis	
1. Basic Fracture Modes and Breakage Resistance of Granite <i>M. P. Luong</i>	3
2. Behavior of Coal Caused by Water or Carbon Dioxide <i>J. Gustkiewicz & Y. Orengo</i>	18
3. Coupled Effects Between Mechanical Behavior and Mass Transfer Phenomena in Rock Salt <i>Ph. Cosenza & M. Ghoreychi</i>	28
4. A Programme of Underground Instrumentation and Laboratory Tests, to Understand the Rock Mass Behaviour on the Merensky Reef, Bushveld Complex <i>B. P. Watson</i>	38
5. Experimental Study on Physical Mechanical Characters of Quasi-Sandstones <i>L. X. Huang</i>	48
Ultrasonic and Micro-Seismic Measurements	
6. Damage Process of Sedimentary Rocks: Advanced Processing of Ultrasonic Waves <i>J. F. Couvreur et al.</i>	59
7. Microseismic Monitoring of Longwall Caving Processes at Gordonstone Mine, Australia <i>X. Luo, P. Hatherly & B. McKavanagh</i>	67
8. The Laboratory Study of Deforming Behavior and Related Acoustic Emission of Different Rocks <i>P. Konečný</i>	80

XII

9. Study on Stability of Shaft Wall by Acoustic Emission Monitoring System 90
S. L. Li, K. S. Yu & Y. F. Sang

Intelligent Rock Mechanics

10. Predicting Rock Fracturing Behaviors Under Creep Conditions in Terms of Intelligent Rock Mechanics 101
X.-T. Feng & M. Seto

Rock Stress

11. New Approach to Reconstruction of Large Scale *In Situ* Stresses and Moduli 115
A. N. Galybin, A. V. Dyskin & R. J. Jewell
12. Theoretical and Practical Analysis of *In-Situ* Rock Stress on the Underground Workings in Jinchuan Mines 125
C. S. Tai

Numerical Analysis

13. A Method to Calculate Stresses and Deformations in 3D Layered Strata 135
A. M. Linkov et al.
14. Manifold Method and its Applications to Rock Engineering 145
W. Y. Zhou, Q. Yang & R. Q. Yang
15. An Elasto-Plastic Finite Element Analysis for the Stability of Rockmass Abutment and the Stress of High Arch Dams 155
Q. C. Ma, G. Y. Li & L. Qi
16. Application of the Finite Thick-Plate Strip Method in the Underground Blast-Resistant Structures 163
J. Wu, Q. X. Li & F. H. Li

Theoretical Analysis

17. Flow and Deformation in Anisotropic Fractured Porous Media 175
M. Bai & J.-C. Roegiers
18. Simple Constitutive Equations for Brittle Rocks, Based on Strain-Dependent Stiffness 186
Y. Fujii & Y. Ishijima
19. Poroelastic Stability Analyses of Inclined Boreholes in Saturated Formations 194
L. Cui, J.-C. Roegiers & Y. Abousleiman
20. Advances in the Creep Compliance Theory of Viscoelastic Surrounding Rock Masses 204
L. Xue & R. Luo

Stability of Rock Engineering

21. Stability of Underground Stratified Hard Rock Roofs 217
A. I. Sofianos & A. P. Kapanis
22. Deformation and Fracturing in Underground Mining 227
A. Vervoort
23. A New Method for Stability Analysis of Rock Slope 237
D. Y. Zhu & Z. S. Zhou
24. Load Approach on Circular Tunnels in Rock Characterized by Major Joint Sets 257
Ch. N. Marangos

Rock Reinforcement

25. A New Approach to Convergence Confinement Method 267
D. Nguyen Minh & C. Guo

XIV

26. Practice and Theory of the Integrated Technology of Rock Reinforcement 280
R. Snupárek

27. Stability of Rock in Tunnel and Design of Support 290
B. Amusin

Drilling Model

28. Evaluation of Drilling Parameters of a PDC Bit 301
H. Geoffroy et al.

Rock Classification

29. An Introduction of the Chinese Standard for Engineering Classification of Rock Masses (GB50218 - 94) 317
Y. M. Lin