

58th US Rock Mechanics / Geomechanics Symposium 2024

Golden, Colorado, USA
23-26 June 2024

Volume 1 of 8

ISBN: 979-8-3313-0508-6

Printed from e-media with permission by:

Curran Associates, Inc.
57 Morehouse Lane
Red Hook, NY 12571



Some format issues inherent in the e-media version may also appear in this print version.

Copyright© (2024) by the American Rock Mechanics Association
All rights reserved.

Printed with permission by Curran Associates, Inc. (2025)

For permission requests, please contact the American Rock Mechanics Association
at the address below.

American Rock Mechanics Association
Peter Smeallie, Executive Director
600 Woodland Terrace
Alexandria, Virginia 22302-3319

Phone: (703) 683-1808
Fax: (703) 997-6112

info@armarocks.org

Additional copies of this publication are available from:

Curran Associates, Inc.
57 Morehouse Lane
Red Hook, NY 12571 USA
Phone: 845-758-0400
Fax: 845-758-2633
Email: curran@proceedings.com
Web: www.proceedings.com

TABLE OF CONTENTS

VOLUME 1

Enhancement of an FDEM-Based Geomechanical Simulation Software with Hybrid FEM-FDEM and Elasto-Plastic Modeling Capabilities: Application to Slope Stability Analysis	1
<i>A. Lisjak; L. He; J. Ha; B. S. A. Tatone; O. K. Mahabadi</i>	
Investigation of a Deep-Seated Gravitational Slope Deformation in Western Carpathian Mts., Slovakia	17
<i>A. Tolocka; A. Mortazavi; V. Kapustová</i>	
Numerical Simulation of Elastic Wavefield Evolution in Heterogeneous Fractured Media Based on a Combined Displacement Discontinuity-Discrete Fracture Network Model	23
<i>S. F. Wang; Z. X. Zhang; X. Huang; Q. H. Lei</i>	
A Unified Computational Framework for Modelling Rock Failure Evolution: From Progressive Degradation to Catastrophic Rupture and Avalanche	33
<i>Liang Wang; Qinghua Lei</i>	
Growth Parameter Conditioning of Genetic Discrete Fracture Networks to Trace Length Distribution Data	43
<i>J. Kim; J. Choi; J. Leem; J.-J. Song</i>	
Investigation on the Spatial Variation in Fracture Orientation and Its Impact on Hydraulic Behavior of Rock Mass.....	50
<i>J. Choi; J. Kim; J.-J. Song</i>	

MINING - EXPERIMENTAL MINING ROCK MECHANICS

Crack Initiation (CI) Thresholds from Acoustic Emission and Stress-Strain Data: A Comparison of Values Measured for Rocks from Montana and Idaho	57
<i>M. C. Humphreys; C. Link; S. M. Berry; M. M. Maclaughlin</i>	
Characterization and Monitoring of Damage Evolution in Brittle Rock During Primary, Secondary, and Tertiary Creep Phases	65
<i>M Imani; A Hedayat; G Walton</i>	
Mechanical Responses and Dynamic Seepage Evolution Laws of Rock Mass Containing Inclined Rough Fracture Under Three-Dimensional Stress.....	75
<i>J. Z. Tang; G. M. Zhao; J. C. Chang; Z. Q. Yin; M. K. Duan; T. Wang</i>	
Post-Peak Multi-Stage Triaxial Testing of Miniature Rock Mass Samples.....	91
<i>S. D. Cylwik; D. W. Childs; D. M. Mahoney; K. M. Plange; C. M. Grubb</i>	
Dynamic Stress Wave Behaviors Across Single Fluid-Filled Rock Fractures	99
<i>H. Yang; H. F. Duan; Q. Zhao; J. B. Zhu</i>	
3DEC Modelling Exploration of Residual Stress Mechanisms	108
<i>M. Trzop; A. G. Corkum</i>	

PETROLEUM UNCONVENTIONAL - HYDRAULIC FRACTURING I - THEORETICAL AND NUMERICAL MODELING

Analysis of Shear Slip Ahead of Hydraulic Fracture Along a Frictional Interface Not Aligned with Principal Stresses and Conditions for Secondary Branching.....	116
<i>X. Weng</i>	
Modeling Near-Wellbore Hydraulic Fracture Behaviors Under Combined Impacts of Wellbore Perforation and Natural Fractures.....	128
<i>W. Fu; B. Damjanac; Z. Radakovic-Guzina; A. Finnila; R. Podgorney; J. McLennan</i>	
Challenges and Uniqueness of a Dual-Injection Fracture Model	134
<i>O. Kresse; B. Hobbs; Y. Pei</i>	
The Sunset Solution: Closure on Leaking Proppant	148
<i>A. P. Peirce; S. Abbas; E. Detournay</i>	
Poroelectric Effects on the Interpretation of Diagnostic Fracture Injection Tests	157
<i>Jun Du; Boshen Li; Tianxiang Huang; Guanshui Xu</i>	
Impact of Cold Fluid Injection on Hydraulic Fracture Propagation	168
<i>J. Rueda; C. Mejía; P. Firme; D. Roehl; D. Rossi; F. Henriques; E. Sousa; R. Chaves</i>	

PETROLEUM CONVENTIONAL - DRILLING & COMPLETION: OPENHOLE

Transient Effects of Time-Dependent Drilling Fluids on Wellbore Stability.....	177
<i>Y. Ma; V. Dokhani; H. Miao; T. Geng; Z. Shi</i>	
Assessment of Thermal Effects on the Formation Breakdown Gradient in APB Mitigation Scenarios	186
<i>B. S. P. Souza; C. O. Souza; S. A. B. Fontoura</i>	
Investigation of Failure Mode and Permeability Evolution of Inclined Heterolithic Strata Using Coupled Discrete Element Method-Computational Fluid Dynamics Model.....	196
<i>X. H. Yin; B. Zhang</i>	
Research and Application of ROP Enhancing Technology with Axial-Torsional Coupled Percussion in Tight Shale Drilling	206
<i>Zhaowei Sun; Xiaoguang Wu; Zikang Wang; Zhongwei Huang; Zongjie Mu; Xiangyang Wang; Yury Popov</i>	
A Statistical Approach to Estimate the Drilling Mud Window Based on Field Data and Ten Failure Criteria in Depleted Reservoirs - New Modified Failure Criterion	214
<i>Ahmed Alsubaih; Kamy Sepehrnoori; Alberto Lopez Manriquez; D. Nicolas Espinoza; H. Raed Allawi; Swadi Hayfaa</i>	
Reservoir Compaction Damage Evaluation in Hydraulically Fractured Oil Wells Incorporating Geomechanics	224
<i>F. B. Fernandes; A. M. B. Braga; M. C. Duarte; E. Gildin</i>	

GEOTHERMAL - GEOTHERMAL RESERVOIR DESIGN AND TESTING

Simulating Coupled THM Problem and Wellbore Integrity Analyses with Two-Phase Fluid Flow in Naturally Fractured Reservoirs.....	237
<i>Yarlong Wang</i>	
An Assessment of Geomechanical Considerations in Thermal Energy Storage Systems Using 3D Coupled Thermo-Hydro-Mechanical Models.....	244
<i>U. Mutlu; A. Ghassemi; G. Boitnott</i>	
Modeling a Deep Coaxial Closed-Loop Vacuum Insulated Tubing (VIT) Completion in a Geothermal Research Test Well Using FEFLOW	254
<i>G. Chen; C. Wright; J. Liu; C. Gomez; A. Garcia</i>	
Unsupervised Machine Learning for Delineating Stratigraphy in Subsurface Reservoirs for the Utah FORGE Geothermal Project Ayyaz Mustafa	267
<i>Ayyaz Mustafa; Mark Kelley; Guanyi Lu; Andrew P. Bunger</i>	
FDEM Modeling of PDC Cutter-Rock Interactions for Geothermal Drilling Applications	283
<i>E. Heilman; B. Euser; L. Frash; M. Meng; W. Li; Z. Lei; E. Rougier</i>	
Tool Development and Field Test of the Stress Measurement Method with Dual Bit Coring Applicable to Geothermal Fields.....	289
<i>T. Ito; K. Kaneko; M. Sasaki; K. Ogawa; T. Yokoyama; A. Funato; K. Tezuka</i>	

CIVIL - INNOVATIVE TESTING OF ROCKS AND ROCK-LIKE MATERIALS

Acoustic Emission Characteristics on the UCS of a Synthetic Rock	297
<i>P. K. Gautam; Marte Gutierrez</i>	
Mechanical and Hydraulic Characterization of 3D Printed Rock Analogues of Poorly Cemented Sandstone	306
<i>D. Cartagena-Pérez; A. Rangriz Shokri; G. Zambrano Narvaez; R. Chalaturnyk</i>	
Experimental Investigation of Damage Induced Creep in Organic Rich Shales: Insights from Beetaloo Shale, Australia.....	311
<i>Umar Farooq; Mohammed Abdul Qadeer Siddiqui; Hamid Roshan</i>	
Mode I Fracture Behavior of Metakaolin-Based Geopolymers Made of Mine Tailings	319
<i>M. Asadizadeh; C. Clements; A. Hedayat; L. Tunstall; H. Gelber Bolanos Sosa; N. Tupa; I. Yanqui Morales</i>	
Development of a Methodology for Predicting the Strength of Intact Bentonitic Shale and Gypsiferous Siltstone Using Fragments and Micro-Indentation Modulus Testing.....	330
<i>Calvin Tohm; Bret Lingwall; Rudrajit Mitra</i>	
Effect of Physical Properties on the Mechanical Behavior of Wyoming Siltstone Under Uniaxial and Triaxial Compression.....	338
<i>Kam Ng; Lokendra Khatri; Esraa M. Alomari</i>	

MINING - CASE STUDIES IN MINING GEOMECHANICS - I

Lessons Learned from Recent Longwall Mine-By Cases with Uncemented Casings	345
<i>P. Zhang; D. Su; B. Tulu; B. H. Kim</i>	

Longwall-Induced Shale Gas Well Casing Deformations and Stresses-Critical Effects of Geologic and Geometric Parameters.....	354
<i>W. H. Su; P. Zhang</i>	
Investigating the Energy Balance of Two Mining Methods Set in a Deep Underground Metal Mine in the U.S.....	364
<i>B. H. Kim; T. M. Emery; M. Armatys</i>	
Investigation into the Rock Mass Response to Pillar Extraction in a Hard Rock Tabular Mine	371
<i>S. Moyo; T. Chikande; T. Zvarivadza; R. T. Masethe; A. C. Adoko; M. Onifade; A. A. Firoozi</i>	
A Study of the Key Factors Associated with a Massive Pillar Failure in an Underground Limestone Mine Using Numerical Models	380
<i>G. Rashed; X. Yuting; N. Evaneck</i>	
New Afton Convergence Monitoring and Rehabilitation Planning in the B3 Footprint.....	391
<i>S. Owre; E. Tilley; C. Kamp</i>	

PETROLEUM UNCONVENTIONAL - HYDRAULIC FRACTURING II - EXPERIMENTATION, SIMULATION, AND FIELD RESULTS

Modeling Fracture Mechanics for 3D-Printed Porous Replicas Using Phase-Field Finite Element	401
<i>A. G. Almetwally; M. F. Wheeler</i>	
Effect of Shear Thickening Fluid on the Hydraulic Fracturing Behavior.....	410
<i>Y. Mukuhira; N. Watanabe; K. Sueyoshi; K. Takuma; R. Zhang; T. Tomai; Y. Arai; M. Uno; T. Ito; R. Goto; T. Tian; V. Sokolovski; M. Naoi</i>	
Optimizing Hydraulic Fracturing in the Paradox Formation: Geomechanical Study of the Cane Creek Play	416
<i>N. Z. Dvory; J. D. McLennan; B. J McPherson</i>	
Modelling the Hydraulic Injection Fracture Response in Layered Media for Megablock Experiments.....	423
<i>E. Magsipoc; G. Grasselli</i>	
Deciphering the Tensile Fracturing Process Using Acoustic Emission	433
<i>Shan Wu; Hui Yang; Qi Zhao; Boyang Su; Guanglei Cai</i>	
A Play-Agnostic Thermo-Poro-Hydro-Mechanical Approximation for Hydraulic Fracture Initiation: Insights on Stress Distortions Between the Wellbore and a Perforation Tunnel.....	442
<i>Nassim Bouabdallah; Andreas Michael</i>	

PETROLEUM CONVENTIONAL - RESERVOIR GEOMECHANICS I - ANALYTICAL AND NUMERICAL MODELING

Pressure and Stress Prediction Using Seismic Velocities, 3D Geomechanical Models and the Full Stress Tensor: Mad Dog Field, Deepwater GoM.....	454
<i>M. A. Nikolinakou; P. B. Flemings; M. Heidari; X. Wang; M. Johri</i>	
Influence of Injection Induced Fractures Along Horizontal Wells with ICDs During Subsurface Cold Fluid Injection.....	461
<i>Jinchuan Hu; Mukul Sharma</i>	

Evolution of the Reservoir Stress Path During Depletion and Re-Inflation and Its Implications.....	474
<i>P. Seth; D. Mikulencak; R. Hofmann; J. W. Dudley</i>	
Numerical Study on Mode I Fracture Characteristics of Rock Under Confining Pressure	482
<i>Senlin Luo; Guangqing Zhang; Bin Sun; Renyi Qiu; Yansen Ling</i>	
Study on Adsorption Characteristics of Micro-Nano Proppants in Fractures and Related Numerical Simulation	491
<i>C. Lu; Q. Y. Zhu; Y. Li; C. Luo; T. B. Liu</i>	
Búzios Field: Coupled Model to Face the Geomechanical Challenges of the Giant Carbonate Offshore Field.....	498
<i>F. O. L. Falcão; A. G. Cordovil; A. L. M. Maria; G. Orrico; B. Fidalgo; M. Parcerro; A. Alves; L. F. Fernandes</i>	

GEOTHERMAL - GEOTHERMAL RESERVOIR SIMULATION

A Microscale Analysis of Millimeter-Wave Induced Vitrified Basalt for Use in Enhanced Geothermal Energy Systems	505
<i>E. R. Meltzer; D. Stefaniuk; H. H. Einstein</i>	
Solving Coupled Partial Differential Equations in Porous/Fractured Geomaterials	516
<i>X. Cui</i>	
Thermo-Poro-Elastic Stress Alteration Around an EGS Well Due to Cold Fluid Circulation	525
<i>G. Lu; Y. Lu; M. Kelley; S. Raziperchikolaee; A. P. Bungler</i>	
Coupled Thermal-Mechanical Behavior of Slate and Its Anisotropic Failure Criterion.....	534
<i>M. C. Weng; S. S. Lin; C. S. Lee; M. T. Pham; H. K. Le</i>	
Laboratory Evaluation of Natural Fracture and Hydraulic Fracture Interactions Using Digital Image Correlation.....	542
<i>Shivesh Shandilaya; Shahrzad Roshankhah</i>	
Coupled Thermo-Hydro-Mechanical Modeling in Enhanced Geothermal Systems	549
<i>Y. Huang; A. R. Stansberry; K. Lipnikov; J. D. Moulton; J. D. Hyman; M. R. Sweeney; X. Huang; Z. Lei; P. H. Stauffer</i>	

SHOWCASE - CANADIAN MINING ROCK MECHANICS (CARMA)

Rock Engineering in Canadian Mining – Highlights, Challenges and Contributions	557
<i>Véronique Falmagne</i>	
Time for a Change? the Role of Rockmass Characterization and Discrete Fracture Networks on the Assessment of Caving Rockmasses.....	558
<i>Jose L. Carvalho</i>	
Rocks, Data, Algorithms: A Roadmap for Practical Machine Learning Adoption in Rock Engineering	559
<i>Josephine Morgenroth</i>	
Towards Mine Closure: Assessing the Long-Term Stability of Open Pit Mine Slopes	560
<i>Erik Eberhardt</i>	

SHOWCASE - FIBER OPTIC SENSING

Fiber Optic Monitoring in Mines.....	561
<i>Herb Wang; Dante Fratta</i>	
Frontiers in Fiber Optic Sensing Beyond Seismic Data	562
<i>Eileen Martin; Shihao Yuan; Tomas Snyder; Daniel Homa; Zack Dejneka; Gary Pickrell; Anbo Wang; Logan Theis</i>	
Seismic Source Characterization with Distributed Acoustic Sensing.....	563
<i>Jiaxuan Li; Weiqiang Zhu; Ettore Biondi; Zhongwen Zhan</i>	
Scalable Civil Infrastructure Monitoring Through Non-Dedicated Distributed Acoustic Sensing.....	564
<i>Jingxiao Liu; Siyuan Yuan; Biondo Biondi; Hae Young Noh</i>	

CIVIL - SLOPE STABILITY, DAMS, AND FOUNDATIONS

Failure Mechanisms in Jointed Rock Slopes Concerning the Dip Angle of Continuous Joints	565
<i>Shivesh Shandilaya; Shahrzad Roshankhah</i>	
Predicting Scour in Unlined Rock Spillways: A Coupled Analytical-Numerical Modeling Approach	572
<i>L. Weidner; M. F. George; D. Clohan</i>	
A Comparison of Tensile Testing Techniques and Predictive Correlations Using Simulated Rock	580
<i>E. J. Lindenbach; J. R. Foran; R. G. Bearce</i>	
Physical Models of Dry Masonry Retaining Walls.....	589
<i>Alejandro; L. R.; Pérez-Rey; I.; M. Muñoz-Menéndez; B. D. Ding</i>	

MINING - GROUND SUPPORT IN MINING

Rockfall Barrier Testing in an Open Pit Mine: Comparing Empirical and Modeled Rockfall Dynamics.....	599
<i>J. C. McNabb; B. J. Meyer; J. J. Potter; S. N. Warren; D. A. Wagner</i>	
Probabilistic Rockfall Analysis in 3D in the Peña Colorada Open Pit (Colima, Mexico).....	605
<i>L. A. Yalan; J. A. Samaniego; R. R. Pozo; E. Jiménez; J. A. Villa</i>	
An Improved Time-Dependent Convergence Confinement Method for Estimation of Tunnel Support Loads in Squeezing Ground Conditions	611
<i>K. Arora; M. Gutierrez</i>	
Investigation on the Setting Time Improvement of Geopolymer Cementitious Material Developed for Pumpable Roof Supports	623
<i>S. Motameni; A. Nikvar-Hassani; L. Zhang</i>	

PETROLEUM UNCONVENTIONAL - WELLBORE MECHANICS

Research on the Evolution of Fracture Network Considering Anti-Frac Hits of Oilfield.....	631
<i>Xinru He; Haiyan Zhu; Peng Zhao; Shijie Chen; Xiao He; Chaoyi She; Majia Zheng; Dajiang Wang; Yuanzhao Li; Junbei Song</i>	

Wellbore Stability Analysis of Wells in Paradox Play in Southeastern Utah: Investigating the Impact of Salt Mobility	641
<i>Pengju Xing; Kevin McCormack; Eric Edelman; Dave List; Gregor Maxwell; John McLennan</i>	
Modeling Transient Wellbore Behavior and Near-Wellbore Damage During Carbon-Dioxide Injection in Depleted Gas Reservoirs	655
<i>V. De Gennaro; A. C. Vasper</i>	
Enabling Geomechanical Insights from Drilling Data: Automated and Data-Driven Proxy Mechanical Earth Modeling	663
<i>C. Jeong; S. Lin; A. Reyes; V. Sharma; A. S. Wendt</i>	

STORAGE & SEQUESTRATION - CO2 UTILIZATION & STORAGE I

Assessing CO2 Leakage Risks and Fault Stability: A Coupled Flow and Geomechanics Simulation with Uncertainty Analysis of Fault Properties	672
<i>Sangcheol Yoon; Romain Prioul; William J. Bailey; Richard Birchwood; Adrian Rodriguez-Herrera; Joe Stefani</i>	

VOLUME 2

Elastic, Viscoelastic, and Permeability Response of Kentucky Sandstone in the Presence of scCO2.....	685
<i>A. Kamali-Asl; A. R. Kavscek</i>	
Permeability of Serpentinized Harzburgite and Its Implications on Mineral Carbon Storage.....	692
<i>Pouyan Asem; Anh Nguyen; Zdenek P. Bažant; Juerg Matter; Joseph F. Labuz</i>	
Carbon Mineralization in Mafic Formations: Fracture Topology and Hydro-Chemo-Mechanical Coupling	696
<i>A. Muñoz-Ibáñez; J. C. Santamarina</i>	

GEOTHERMAL - SEISMICITY AND GEOMECHANICS IN GEOTHERMAL ENVIRONMENTS

The Influence of Stress Heterogeneity on Hectometer Scale Hydraulic Stimulation Experiments	700
<i>K. Bröker; B. Valley; N. Gholizadeh Doonechaly; M. Roskopf; M. Hertrich; D. Giardini; _ Bedrettolab Team; A. P. Rinaldi; V. Clasen Repollés; A. Obermann; X. Ma</i>	
Thermal Damage in Crystalline Rocks: The Role of Heterogeneity in Mechanical Performance and Fracture Mechanisms.....	710
<i>Yike Dang; Zheng Yang; Shangtong Yang; Junlong Shang</i>	
A Study of Rock Breakage Under Extreme Submerged Confining Pressure: Can DTH Hammer Drilling Deliver?.....	723
<i>L. Gerbaud; N. Velmurugan; J. Aising; C. Chambres; S. Naderi; J. P. Latham; J. Xiang; X. Yang</i>	
Modeling Coupled Hydro-Mechanical Processes During Hydraulic Stimulation at the Bedretto Underground Laboratory	735
<i>V. Clasen Repollés; D. Jiang; A. P. Rinaldi; A. Obermann; S. Wiemer; K. Bröker; X. Ma; M. Roskopf; N. Gholizadeh Doonechaly; M. Hertrich; H. Maurer; D. Giardini; _ Bedrettolab Team</i>	

MINING - POSTERS MONDAY

Preliminary Blast Fragmentation Modeling in an Underground Aggregate Operation	746
<i>L. Shields; J. Calnan; J. Silva; E. Maldonado; Z. Agioutantis</i>	
Rock Mass Failure and Remedial Measures Implemented When Excavating Ultra-Deep Shaft Stations	752
<i>J. Lindsay; A. Hall; M. Cai; B. Simser</i>	
Enhanced Method for Measuring Joint Roughness Using Sub-Millimeter Resolution 3D Laser Scanning	762
<i>M. Shintassova; S. A. Sepúlveda; S. Fatolahzadeh</i>	
A Proposed Framework to Estimate Pillar Strength in Room-And-Pillar Hard Rock Mines	769
<i>N. Z. Dzimunya; Y. Fujii</i>	
Definition Please – a Rock Engineering Dictionary	777
<i>B. Yang; Y. Li; E. Ambah; D. Elmo</i>	
Deformation Characteristics and Damage Evolution Mechanisms of Dry and Saturated Argillaceous Siltstone Under Cyclic Loading	781
<i>P. Wu; J. Chen; X. D. Fu; J. H. Huang</i>	
Study on the Damage Mechanism of Rock Around Wells Subjected to Impact Loading.....	790
<i>T. Huang; Q. Y. Liu; H. Y. Zhu; X. W. Dai; R. Ji; X. He; C. Y. She; M. J. Zheng</i>	
Measuring Brittle Damage Thresholds of Crystalline Rocks by Acoustic Emissions on Compressive and Tensile Laboratory Tests	800
<i>E. A. Malicki; T. R. M. Packulak; É. Gagnon; M. S. Diederichs; J. J. Day</i>	
Optimizing Overall Slope Angle and Net Present Value (NPV) Through the Utilization of Ground- Based Pit Wall Monitoring Data	808
<i>E. A. Quansah; A. Anani; S. Adewuyi</i>	
Characterization of Direction-Dependent Properties of Sierra White Granite: Initial Results	817
<i>L. Kafle; U. Mok; H. H. Einstein; R. Villamor-Lora; J. Germaine</i>	
Behavior of Post-Yielding Parameters of Marble During Plastic Deformation.....	824
<i>S. Sarkar; R. Kumar</i>	
Optimal Camera Angle for Measuring Joint Roughness Using UAV-Based 3D Photogrammetry.....	830
<i>J. Leem; J. Choi; I. S. Kang; J.-J. Song</i>	
Study on the Variation Characteristics of Rock Mechanical Parameters of Coal Seam Roof Under the Influence of Artificial Fractures.....	839
<i>H. Zhou; L. Zhang; G. H. Shi; L. Liu; F. J. Zhou; B. Wang; W. C. Wang; Y. Y. Liu</i>	
Update on Rock-Type Specific Hoek-Brown Constant “s”	848
<i>A. Khamitova; F. T. Suorineni; Y. Madenova</i>	
Is There a Universal Rock Mass Classification System?.....	856
<i>E. Ambah; D. Elmo</i>	

Laboratory Investigation on Relations Between Characteristic Impedance, Energy Transformation and Dynamic Stress Induced Faults in Rocks.....	868
<i>T. M. Ozoji; Z-X. Zhang; A. E. Aladejare; B. K. Serasinghe; N. Bakkamuntala; N. G. Obaje; M. U. Umar</i>	
Geotechnical Design for Open Pit Coal Mining in Proximity to Electrical Power Lines: Risks, Mitigation, and Regulatory Compliance.....	874
<i>T. Zvarivadza; S. Ng'Andu; L. Zindi; M. Mohutsiwa; R. T. Masethe; A. C. Adoko; M. Onifade; T. Chikande; S. Moyo; A. A. Firoozi</i>	
Calibration of 2D Finite Element Method Rockbolt Models to Fiber-Optic Axial Load Testing Data for Grouted Rebar Rockbolts.....	882
<i>C. P. Fischer; M. S. Diederichs; B. Forbes</i>	
Laser-Induced Rock Breakage (LIRB) Technology in Mining Engineering - A Review	889
<i>R. P. Madavi; R. Mitra; P. Diwakar</i>	
Periodic Assessment of Seismicity to Assess the Ground Support Requirements on Potential Fault Headings - Case Studies	896
<i>A. R. S. Leite; D. Landry; N. Ramdass; G. Hooey; J. Roy</i>	
Geotechnical Implications of Large Shale Deposits on the Stability and Productivity of Iron Ore Mines: A Comparative Study.....	905
<i>A. Mohanty; M. K. Mishra; S. Ghosh; B. B. Sahoo; C. Behera; J. Rostami; M. D. Sesay</i>	

STORAGE & SEQUESTRATION - POSTERS MONDAY

Stress Corrosion Cracking in Carbonates Initiated by Carbonic Acid, a Reactive Molecular Dynamic Simulation.....	917
<i>Jingru Wang; Yuetian Liu; Yuting He; Xinju Liu; Ziyu Lin; Bowei Zhang; Rukuan Chai</i>	
Stability Study of Tight Sandstone Reservoirs During CO ₂ Dynamic Storage Process.....	925
<i>Yuting He; Yuetian Liu; Jingru Wang; Jingpeng Li; Bo Zhang; Rukuan Chai; Pingtian Fan</i>	
Fracture Characteristics of Shale: Unraveling CO ₂ -Driven Mechanical Metamorphosis at Microscale	938
<i>S. A. Mahgoub; S. Abedi</i>	
Effects of Fracture Network Distribution on Lined Rock Caverns Subject to High Internal Gas Pressure	949
<i>C. X. Zhao; Z. X. Zhang; Q. H. Lei</i>	
Geomechanical and Petrophysical Effects of Long-Term Hydrogen Exposure on Berea Sandstone – an Experimental Study	959
<i>S. R. Thiagarajan; H. Emadi; A. Hussain; D. Maury Fernandez; I. Ispas; S. K. Henderson; M. Watson</i>	
Damage Evolution of Sandstone Under Cyclic Loading for Underground Gas Storage	970
<i>Wenhong Zhang; Shouceng Tian; Jintao Weng; Mao Sheng; Tianyu Wang; Zhengchao Ma</i>	
Determination of Thermo-Mechanical Coal Deformations and Implication for CO ₂ Storage in Deep Coal Formations	978
<i>Kunming Zhang; Shimin Liu</i>	
Multiphase Hydraulic Properties of Reservoir Rock in Geologic H ₂ Storage	993
<i>H. Kim; N. Bondarenko; S. Ding; R. Y. Makhnenko</i>	

Nonlinear Acceleration of the Iterative-Sequentially Coupled Flow and Geomechanics Fixed Stress Scheme	999
<i>S. Waziri; G. Ren; P. Tomin; B. Guyaguler</i>	
An Investigation of Fault Geometric Effects on Fault Activation Mechanisms in CO ₂ Storage.....	1008
<i>A. Mortazavi; T. Maratov</i>	
A Feasibility Study on the Pressure Monitoring Above the Injection Zone for CO ₂ Geological Storage in the Uinta Basin, USA	1015
<i>Omar Bakelli; Ting Xiao; Brian McPherson; Carlos Vega-Ortiz; Nathan Moodie; Hichem A. K. Chellal; Ilyas Mellal</i>	
Continuous in Situ Characterization by AFM of Surface Mechanical and Electrical Features of Shale Organic Matter Under Different Atmospheres.....	1024
<i>Ying Kang; Zhengfu Ning; Fangtao Lyu; Zejiang Jia</i>	
Experimental Research on Characteristics of CO ₂ -CH ₄ Transport in Water-Bearing Carbonate Gas Reservoirs.....	1031
<i>Yize Huang; Derek Elsworth; Xizhe Li; Yong Hu; Zhenkai Wu; Qimin Guo; Xiangyang Pei</i>	
Understanding Cement Hydration in CO ₂ Reservoirs: Geochemical Modeling in the Powder River Basin.....	1039
<i>L. Allam; M. L. Malki; I. Mellal; N. Kolla; V. Rasouli; A. Dehdouh; C. Abdelhamid</i>	
Wavelet Transform and Hidden Markov Model Application for Unsupervised Clustering of Microseismic Events from CO ₂ Injection	1048
<i>R. M. Willis; H. Yoon; J. L. Harding</i>	
Numerical Evaluation of Viscous Fingering Behavior During Underground Hydrogen Storage in Saline Aquifers	1055
<i>Jia Cunqi; Hu Jinchuan; Sepehrnoori Kamy</i>	
Laboratory Characterization of Backfill-Buffer Bentonite Blocks Under Hydration Aided by X-Ray CT.....	1061
<i>G. W. Lee; S. H. Yun; M. B. Diaz; K. Y. Kim; M. S. Kim; J. S. Kim; C. S. Lee</i>	
Thermodynamic Modeling of Carbonation of Blended Cements for Wellbore Integrity	1067
<i>Farzana Rahman; Raissa Douglas Ferron</i>	
Estimating Pressure and Fronts in Underground Storage Through Tilt Data Inverse Modelling	1076
<i>R. Abdollahi; A. Movassagh; D. Kasperczyk; M. Haghighi</i>	
Experimental Study on the Corrosion Behavior of Casing Steels Under Oilfield Wastewater Reinjection.....	1085
<i>Yangang Wang; Yongcun Feng; Saxing Li; Bo Yu</i>	

PETROLEUM CONVENTIONAL - POSTERS MONDAY

Research on the Cuttings Transport in Large-Sized Hole Based on CFD-DEM Method.....	1092
<i>Jun Zhao; Wenjun Huang; Deli Gao</i>	
Numerical Simulation of Enhancing Coalbed Methane Recovery by RF Heating with Small Spacing Well Pattern	1101
<i>Rui Liu; Xuelin Dong; Deli Gao</i>	

Dynamic Response and Fatigue Analysis of the Steel Catenary Riser Carrying Slug Flow Based on VFIFE Method	1110
<i>Guangrui Zhang; Yanbin Wang; Deli Gao</i>	
Enhancing Intelligent Drilling Rate of Penetration Prediction Modeling Through Anomalous Drilling Data Handling Methodology.....	1119
<i>Shanlin Ye; Lin Zhu; Zehao Lv; Xianzhi Song; Zihao Liu; Zhaopeng Zhu; Tao Pan</i>	
Deformation and Failure Mechanism of Ultra-Deep Dolomite and FDEM Numerical Simulation	1125
<i>Hongda Li; Yunhu Lu; Ji Li; Ping Zeng</i>	
Real-Time Distributed Fiber Optic Sensing for Cement Sheath Integrity Monitoring	1135
<i>Su Feiyu; Feng Yongcun; Li Xiaorong; Li Saxing</i>	
Kick Warning and Pressure Inversion Method Based on Wellhead Pressure Signal	1144
<i>Shiming Duan; Xianzhi Song; Xuezhe Yao; Zhengming Xu; Mengmeng Zhou; Zhaopeng Zhu; Yueqi Cui</i>	
Hybrid Strategies for Interpretability of Rate of Penetration Prediction: Automated Machine Learning and SHAP Interpretation	1154
<i>Zhengchao Ma; Maoya Hsu; Hao Hu; Tianyu Wang; Xiaoxia Zhou; Gensheng Li; Shouceng Tian</i>	
Evaluation of Mechanical Properties of Heavy Oil Injection and Production Pipelines in Multi-Component Thermal Fluid Corrosive Environment	1162
<i>Jintao Weng; Shouceng Tian; Kangjian Tian; Tianyu Wang; Yawen Tan; Wenhong Zhang</i>	
Study on the Influence Mechanism of the Absent Cement Sheath in Salt-Gypsum Layer on Casing.....	1169
<i>Yifeng Di; Nanxiang Liu; Mingchi Zhu; Lin Tao; Kun Xu; Dongyi Chen; Hongwei Ma</i>	
Numerical Analysis for Mechanical Integrity of Oval Shape Wellbore in Creep Formation.....	1178
<i>Mingchi Zhu; Nanxiang Liu; Xuyue Chen; Yiqi Zou; Gengchen Li; Zilin Zhang; Rong Wang</i>	
Numerical Investigation on the Rock Breaking Performance of Special-Shaped PDC Cutters Combination	1188
<i>Ming Jin; Xuyue Chen; Gengchen Li; Xiaohua Cao; Rong Wang; Mingchi Zhu</i>	
Decomposition of Rock Deformation During Proppant Embedment.....	1198
<i>Li Yaoyang; Zhang Guangqing; Xie Pengxu; Wang Jue</i>	
Comparative Analysis of Critical Bond Strength Parameters of Neat Class G Cement and Fly Ash Enhanced Cement to Steel.....	1205
<i>C. M. Potter; A. Eckert; J. Jones; Z. Weicheng; M. Meng</i>	
Dual-Target Predictive Intelligence Model for Predicting D90 Particle Size and Total Concentration of Lost Circulation Materials.....	1212
<i>Guanyi Shang; Heng Yang; Yongcun Feng; Xiaorong Li</i>	
Experimental Study on Rock-Breaking Characteristics of Conglomerate with Special-Shaped PDC Cutters Under High Confining Pressure	1217
<i>Xiaoyuan Chen; Xinlong Li; Wenhao He; Wei Wang; Zhongwei Huang; Huaizhong Shi; Chao Xiong; Han Chen; Zhenliang Chen</i>	
The Perlite Usage in High Density Oil-Well Cement.....	1226
<i>Abdulmalek Ahmed; Ahmed Mohamed; Salaheldin Elkatatny</i>	

Review of Remedial Cementing: Factors, Design Considerations, and Case Studies	1231
<i>Amir Shokry Youssef; Ahmed Abdulhamid Mahmoud; Salaheldin Elkatatny</i>	
Real-Time Rate of Penetration Prediction for Motorized Bottom Hole Assembly Using Artificial Intelligence	1242
<i>Amir Shokry Youssef; Salaheldin Elkatatny; Abdulazez Abdulraheem; Idham Rahmatullah</i>	
Assessment of Geomechanical Properties of Fault Damage Zones Based on Numerical Modeling.....	1249
<i>F. C. Dias; R. Quevedo; D. Roehl; B. Carvalho</i>	

GEOTHERMAL - POSTERS MONDAY

Maximizing Geothermal Energy Recovery from Enhanced Geothermal Systems Through Huff-And-Puff: A Comprehensive Simulation Study	1258
<i>Lokesh Kumar Sekar; Esuru. R. Okoroafor</i>	
Methodology for Constructing Three-Dimensional DEM Model of Rock Specimen from CT Scan.....	1266
<i>Changdi He; Brijes Mishra</i>	
Monitoring Slip Along Saturated Fractures in Granite at Elevated Temperatures.....	1274
<i>K. Han; L. J. Pyrak-Nolte; A. Bobet</i>	
Feasibility of Repurposing Oil and Gas Wells for Geothermal Energy Production in Wyoming, USA	1282
<i>A. Latrach; A. Dehdouh; C. Abdelhamid; I. Mellal; M. Rabiei</i>	
Enhanced Geothermal Site Characterization Using Generative Adversarial Network and Ensemble Method	1289
<i>Jichao Bao; Jonghyun Lee; Hongkyu Yoon</i>	
Monitoring Geochemical Alteration of Fracture Surfaces in Granite with Electrical Conductivity Measurements.....	1294
<i>E. Christoforidou; A. Bobet; L. J. Pyrak-Nolte</i>	
Fracture Initiation and Propagation Characteristics of SC-CO ₂ Fracturing in Hot Dry Rock: A Coupled Thermal-Hydraulic-Mechanical-Damage Numerical Model Based on Phase Field Method	1303
<i>Xiaoxia Zhou; Tianyu Wang; Zhengchao Ma; Xu Zhang; Maoya Hsu; Yaoyao Sun; Shouceng Tian</i>	
Fluid Injection-Rate Controls on Seismic Moment	1312
<i>M. Roseboom; A. Eijssink; D. Elsworth; J. Yu; C. Marone; J. Rivière; P. Shokouhi; J. Wang</i>	
A New Evaluation Method for Drillability of Hot Dry Rock Considering In-Situ Temperature in Formation	1319
<i>Kun Li; Zhaowei Sun; Zikang Wang; Xiaoguang Wu; Shanlin Ye; Muchen Liu; Xiangyang Wang</i>	
Experimental Determination of the Fracture Toughness of Rocks from Deep Geothermal Reservoirs in Bavaria, Germany.....	1328
<i>Catharina Drexler; Justin Mattheis; Kuroschi Thuro</i>	
Analysis of the Deadwood Formation in North Dakota: Applying Rock Physics	1337
<i>M. Alamooti; S. Namie</i>	

Key Design Parameters for Enhanced Geothermal System (EGS).....	1349
<i>Abdesselem Dehdouh; Ilyas Mellal; Nassima Bettir; Cilia Abdelhamid; Lotfi Allam; Vamegh Rasouli; Emmanuel Gyimah</i>	

VOLUME 3

Molecular Dynamics Modeling of Effects of Water and Temperature on Rock Strength.....	1360
<i>Li Liu; Xinlong Li; Wenhao He; Runqing Zhang; Yongxin Li; Gaojian Fan; Ran Ji; Huaizhong Shi; Chao Xiong</i>	
Study of High-Temperature HDR Fracture Features Under True-Triaxial Stress with Supercritical CO2 Fracturing.....	1368
<i>Xuhao Fan; Haizhu Wang; Mingsheng Liu; Bin Wang; Yunpeng Zhang; Zelong Mao; Yaochen Zhang; Sergey Stanchits; Alexey Cheremisin</i>	
Advances in Hot Dry Rock Engineering for Extracting Heat from Earth: From Permeability Enhancement Strategies to Field Experiences in Enhanced Geothermal Systems (EGS)	1379
<i>B. Mindygaliyeva</i>	

INTERDISCIPLINARY - POSTERS MONDAY

A Cross-Scale Characterization of Porous Rocks Altered by Flow and Dissolution	1393
<i>Z. Xu; W. Li; A. Kolanti; D. Sprouster</i>	
Fluid Flow in a Fracture Network Under Changing Stresses: A Laboratory Study	1402
<i>Z. Mei; W. Li; W. Jin; G. Neupane; T. Atkinson</i>	
Numerical Evaluation of Mass Transfer Process on Acid Reactive Flow in Carbonate Rocks	1412
<i>Jia Cunqi; Alkaabi Saif; Sepehrnoori Kamy</i>	
Mechanism Transition for Fracture Energy Dissipation of Shale Under Crack-Parallel Compression	1418
<i>Min Zhang; Guangqing Zhang; Yansen Ling; Feng Yang; Anhai Zhong; Xuelin Zheng</i>	
High-Performance Modeling of Coupled Hydro-Mechanical Behavior with Graphical Processing Units	1426
<i>N. Bondarenko; R. Makhnenko; Y. Podladchikov</i>	
Statistical Analysis of Rock Cutting Forces Acquired from Full-Scale Linear Rock Cutting Machine Tests.....	1434
<i>Muhammad Ishaq; Muthu Vinayak Thyagarajan; Jamal Rostami</i>	
Study on Numerical Simulation Method of Profile Control with Polymer Microspheres	1451
<i>Mengqi Ma; Junjian Li; Zhouyuan Zhu; Shuai Yuan; Fuwei Yu; Hang Su</i>	
Stress Distribution in Accreting Sediments: A Geomechanical Study of Upper-Plate Faults.....	1461
<i>G. Lopez-Campos; M. A. Nikolinakou; P. B. Flemings; D. M. Saffer</i>	
Deformation and Damage Evolution Characteristics in Laminated Rocks Using Discrete Element Method	1468
<i>Prasad Pothana; Kegang Ling; Fernando E. Garcia</i>	
Investigating the Deformation Characteristics of Dry Mohr-Coulomb Material During Radial Fluid Injection.....	1483
<i>J. S. Kumar; R. K. Kandasami; A. Chaudhuri; E. Detournay</i>	

CIVIL - POSTERS MONDAY

Application of Supervised Learning Algorithms to Predict Engineering Characteristics of Soft to Strong Rock Masses Using Actual TBM Performance Data	1492
<i>Hanan Samadi; Jafar Hassanpour; Jamal Rostami; Jitendra Khatti</i>	
Real-Time Prediction of Potential Hazard Area in Seville's During Underground Excavation with EPB.....	1502
<i>Maziyar Bahri; Sebnem Düzgün; Emilio J. Mascort-Albea; Rocío Romero-Hernández</i>	
Evaluating a Practical Method for Rockfall Magnitude-Cumulative Frequency Estimation	1510
<i>K. Werley; Z. Sala; M. Hille; M. Vessely; G. Walton</i>	
Investigation of the Failure Mechanisms for Inducing Rock Slope Hazard in New Jersey, United States	1519
<i>F. Oppong; P. Khadka; O. Kolawole</i>	
Evaluation of the Sensitivity of Compressional Waves to Assess the Presence of a Macroscopic Flaw in a Pre-Fractured Agaria Marble Specimen.....	1529
<i>Anita Verma; Deepanshu Shirole; Sankhaneel Sinha</i>	
The Thrust-Penetration Gradient: Decoding Geomechanical Dynamics and TBM Response	1538
<i>M. Schlicke; K. Nübel; H. Wannenmacher; F. Amann; T. Marcher</i>	
Monitoring Slope Movement Using Unmanned Aerial Vehicles.....	1545
<i>Calvin Tohm; Bret Lingwall; Linus Uy</i>	
Shear Strength and 1D Compressibility Characteristics of a Plastic and Non-Plastic Soil Exposed to Wet-Dry Weathering	1554
<i>Calvin Tohm; Bret Lingwall</i>	
A New Approach to Model Irregular Particles Breakage with Deploying Image Analysis Techniques on Discrete Element Method	1564
<i>M. Amir Hosseini; P. Tahmasebi</i>	
DEM Modeling of 3D Kinematics in Rock Slope Failure.....	1573
<i>Y. Keissar; I. R. Brown; M. H. Gardner; N. Sitar</i>	
Influence of Buttressing and Lateral Confinement on a Large Block Prior to Rockfall.....	1579
<i>E. Longar; G. Walton</i>	
Development of a Photogrammetric Rockfall Database and Analysis of Trends at a Rock Slope Along I-70W, West of Idaho Springs, CO	1586
<i>J. A. Hollander; G. Walton; R. Kromer</i>	
A Review of Cluster Filtering Methods for Point-Cloud-Based Rockfall Monitoring	1597
<i>E. B. Emmons; G. Walton</i>	
Predicting Excavation Performance of EPB TBM by Using Soil Properties: A Case Study of Dudullu Bostanci Metro Project	1607
<i>M. Seyedrezaei; D. Tumac</i>	
New Insights for Stress Conditions of Laboratory Shear Tests	1615
<i>Shupeng Chai; Qi Zhao</i>	

Incorporating Roughness Degradation Within the Critical State Framework: Modeling the Shear Behavior of Rock Joints	1622
<i>Yuki Matsuoka; Mamoru Kikumoto; Sho Ogata; Kiyoshi Kishida</i>	
Slope Stability Finite Element Modeling of El Misti Volcano, Peru	1631
<i>J. A. Hollander; G. Walton; M. Villeneuve; G. Salas; C. Luza</i>	
Multi-Source Data Fusion and Knowledge Presentation for Shield Tunnel Maintenance Work Based on Knowledge Graph	1642
<i>H. J. Pang; C. C. Zha; F. Jia; Y. D. Xue</i>	
Quantitative Assessment of Anisotropic Elastic Properties of Rock Using Disk Specimens	1649
<i>D. Y. Kim; S. S. Kim; S. M. Seo; M. B. Diaz; K. Y. Kim; H. Kim; E. S. Park</i>	
An Investigation of the Influence of Random Packing on PFC3D Simulations of Unconfined Compression, Brazilian, and Three-Point Bending Tests	1658
<i>M. Haydn-Myer; M. Maclaughlin; L. Arnold</i>	
Hypoplastic Model Predictions for Ennore Sand Under Monotonic and Cyclic Loading Conditions	1665
<i>S. Wani; M. U. Rehman; M. S. Rao; R. K. Kadasami; S. Banerjee</i>	

PETROLEUM UNCONVENTIONAL - POSTERS MONDAY - 1

Physical Simulation Experiment Research for Hydraulic Fracturing in Tight Sandstone Reservoir Under Different Stress Conditions and Nature Fracture Combinations.....	1674
<i>Pingtian Fan; Yuetian Liu; Ziyu Lin; Jingru Wang; Yuting He; Bowei Zhang</i>	
Proppant Migration and Distribution Simulation in Tortuous Fractures with Gradually Narrowing Walls.....	1680
<i>Pengyin Yan; Zhiming Wang</i>	
Four-Dimensional Stress Evolution and Optimization of Child Well Fracturing Parameters in Multi Sub-Layers Shale Gas Reservoir	1689
<i>Haixin Yang; Xuanhe Tang; Haiyan Zhu; Xiao He; Chaoyi She; Majia Zheng; Jianfa Wu; Yi Song; Haoyong Huang; Junfeng Li; Dajiang Wang; Yuanzhao Li; Junbei Song</i>	
Design and Application of Differential Staged Fracturing in Continental Shale Oil: A Case Study of Well X from Fuxing Area, China.....	1700
<i>Xinliang Wang; Jianye Mou; Budong Gao; Lufeng Zhang</i>	
Numerical Simulation of Flow Field and Erosion Characteristics in Hydraulic Fracturing Tool.....	1706
<i>Xianzhi Song; Yueqi Cui; Mengmeng Zhou; Xu Zhengming; Zhaopeng Zhu; Gensheng Li</i>	
Study on Microscopic Pore-Fracture Structure of Metamorphic Buried Hill Reservoirs.....	1714
<i>Xifeng Wang; Shijun Huang; Fenglan Zhao; Xinrong Liu</i>	
Failure Mechanism Analysis of CO2 Flooding Wellbore Tubing.....	1720
<i>Hui Li; Jun Li; Liping Shan; Wei Lian; Jinlu Liu</i>	
Analysis of the Influence of Defective Cement Ring on Casing Stress During CO2 Geological Storage.....	1728
<i>Hui Li; Jun Li; Liping Shan; Wei Lian; Jinlu Liu; Xing Zhao</i>	
Experimental Study on Interaction Behavior Between Caves and Fractures in Fractured-Vuggy Carbonate Rock	1736
<i>Zhenquan Zheng; Bing Hou; Zhiqiang Zhao</i>	

Experimental Study on the Size Effect of Fracture Process Zone of Mixed Mode I-II Crack in Sandstone	1742
<i>Bin Sun; Guangqing Zhang; Senlin Luo; Dingshan Cai; Yansen Lin; Dawei Zhou</i>	
The Impact of Bedding Plane Density on the Hydraulic Fracture Vertical Propagation and the Near-Wellbore Fracture Patterns in Shale Oil Reservoirs	1749
<i>D. Y. Zhu; J. Y. Mou; Y. S. Zou; S. C. Zhang; X. H. Zhou; X. H. Zhang; Z. W. Zhao</i>	
Simulation of Elastic Waves Transmission and Attenuation Considering Fluids Properties Change and Radiator of Branches Well	1757
<i>Yawen Tan; Shouceng Tian; Yiqun Zhang; Tianyu Wang; Fei Wang</i>	
Experimental Study on the Formation Mechanism of Complex Network During Supercritical CO ₂ Fracturing in Jimsar Oil Field.....	1762
<i>Lizhe Li; Longqiao Hu; Weiyu Tang; Xiaoyu Hou; Fujian Zhou; Bo Wang</i>	
Characteristics of Hydraulic Fracture Height Growth in Deeply Layered Coalbed-Mudstone Reservoir	1768
<i>Zhiwei Wang; Mao Sheng; Lejia Ren; Chao Deng; Bo Wang; Jia Wang</i>	
Fracture Morphology in Glutenite Reservoirs Stimulated by Radial Borehole Fracturing	1774
<i>Yuning Yong; Shouceng Tian; Zhaoquan Guo; Tianyu Wang; Chengxiang Wei; Jiaheng Zhai; Mao Sheng</i>	
Numerical Simulation of Hydraulic Fracturing Considering Grain Boundary Weakness and Fluid-Rock Heat Transfer.....	1781
<i>S. Ikeda; S. Ogata; H. Yasuhara; K. Kishida</i>	
Characterization of Non-Uniform Propped Fractures and Critical Aperture Strain Caused by the Stresses in Conglomerate Reservoir	1790
<i>Buge Du; Guangqing Zhang; Xiaohan Wang; Changzhuo Xu; Kaixin Liu</i>	
Numerical Simulation of Gas Leakage During Controlled Retracting Injection Point Process for Underground Coal Gasification.....	1797
<i>Tianduoyi Wang; Juntai Shi; Kelu Wu; Zhangxin Chen</i>	

PETROLEUM UNCONVENTIONAL - POSTERS MONDAY - 2

Modeling of Immiscible Fluid Flow in Mixed-Wetted Porous Media Using the Lattice Boltzmann Method	1808
<i>Shengting Zhang; Jing Li; Tianduoyi Wang; Qingyuan Zhu; Kelu Wu; Zhangxin Chen; Zhangxin Chen</i>	
Simulating Cyclic Hydraulic Injection-Induced Fatigue with an Improved Discrete Element Method Model	1821
<i>Chang Xia; Qi Zhao</i>	
Numerical Simulation Study of Proppant Migration and Settlement Behavior in Complex Fractures	1830
<i>Zhao Kangjia; Wang Jie; Xu Hualei; Jiang Houshun</i>	
Study on the Influencing Factors of Matrix Acidification Effect in Carbonate Reservoir.....	1837
<i>L. Zhang; H. Xu; K. Zhao; J. Wang</i>	
Study on Rock Mechanics Microscopic Heterogeneity Characterization, Fracture Propagation Simulation and Frac-Ability Prediction of Complex Mode Conglomerate in Mahu Block	1843
<i>S. K. Liu; Y. S. Zou; S. C. Zhang; X. F. Ma; L. Liu; X. H. Zhang; Z. W. Zhao; Z. P. Zhang</i>	

Correlations Between Microscale Dimensions and Elastic Anisotropy in Shale.....	1853
<i>Junfeng Zhu; Guangqing Zhang; Min Zhang; Chuangchao Xu; Houze Chen</i>	
Study on Stress Sensitivity Damage Evaluation in Tight Low-Permeability Gas Reservoirs	1861
<i>Hengli Zhai; Xing Yu; Qingjiangpeng Zhu; Tongyao Liang; Qirui Huang; Haizhu Wang; Bin Wang; Sergey Stanchits; Alexey Cheremisin</i>	
High-Precision Triple Multiscale Model Characterizes the Complex Pore-Fracture System of Continental Shale Reservoir	1871
<i>Haoyu Li; Wendong Wang; Yuliang Su; Yuxuan Deng; Dongxia Li; Lei Li; Yongmao Hao</i>	
Study on Fracture Propagation Law of Cement Sheath Interface During Fracturing Process.....	1878
<i>Chenxi Lai; Yongcun Feng; Feiyu Su; Chenwang Gu; Xiaorong Li</i>	
Experimental Study on Fracture Propagation Characteristics of CO ₂ Pre-Fracturing in Shale Oil Reservoir	1887
<i>Hua Wu; Xiaoqiong Wang; Hongkui Ge; Jiaxin Song; Shuoyang Hou; Jixiang He; Zhenyu Wang</i>	
Numerical Research of Fracture Initiation in Hydrate Reservoirs Based on XFEM.....	1894
<i>Jinshan Wang; Yiqun Zhang; Chengyu Hui; Yingqiao Ren; Xu Cui; Yiquan Jiang; Youkeren An; Haochen Huang</i>	
Study on the Mechanism of Wellbore Instability in Complex Shale Formations Considering Fault Influence: A Case Study of Fushan Oilfield	1904
<i>Xing Yu; Haizhu Wang; Tongyao Liang; Qirui Huang; Xuhao Fan; Yunpeng Zhang; Bin Wang; Sergey Stanchits; Alexey Cheremisin</i>	
Numerical Simulation of Hydraulic Fracture Vertical Propagation in Bedded Shale by Phase-Field Method	1913
<i>Ganghua Tian; Haizhu Wang; Bin Wang; Mingliang Shi; Yong Zheng</i>	
Testing the Key Fracture Mechanical Parameters of Shale-Sand Bedding Interface by Digital Image Method	1922
<i>D. Ma Xiong; X. F. Zhang; H. Q. Yang; J. Zhu; X. H. Zhang; L. Liu</i>	
Research on the Characteristics of Supercritical CO ₂ Shock Fracturing Flow Field Based on Numerical Simulation.....	1931
<i>Changhui Zeng; Zongjie Mu; Haizhu Wang; Chuanyou Xu; Yonggang Yi; Sergey Stanchits; Alexey Cheremisin; Yury Popov</i>	
Foam-Based Hydraulic Fracturing from Lab to Field Applications: A Brief Review	1943
<i>Ahmed Abdelaal; Murtada Saleh Aljawad; Dhafer Al-Shehri</i>	
Microscale Mechanical Anisotropy of Shale	1959
<i>W. E. Wilson Espinoza; F. R. Fereshteh Rahmani</i>	

CIVIL - TUNNELS AND UNDERGROUND STRUCTURES

Estimation of Tunnel Project Completion Time by Combining the CSM2020 Discrete Event Simulation Model with Decision Aid in Tunneling (DAT).....	1967
<i>A. Khetwal; J. Rostami; H. Einstein</i>	
GEMINI, a Novel Software System to Improve the Penetration Rate of a Tunnel Boring Machine	1974
<i>I. Aliguer; I. Oliver; C. De Santos; F. Vara; J. Gomez</i>	

“SINTEF-TriPOD” in Underground Design – a Demonstration for Two Projects in Norway	1980
<i>N. Trinh; E. Grøv</i>	
Control Technology of High Prestress Excavation Compensatory Support in Tunnels Through Fault Fracture Zones.....	1989
<i>Jihao Sun; Xiaojie Yang; Manchao He</i>	
Tunnel-Ground Interaction Modelling in Jointed Stratified Rock Masses Under Long-Term High-Speed Train Loading.....	1999
<i>Z. X. Zhang; J. Y. Yang; W. B. Pan; S. F. Wang; Q. H. Lei</i>	
Tunnel Interaction in Low-Permeability, Squeezing Ground	2008
<i>A. N. Nordas; T. Leone; G. Anagnostou</i>	

MINING - CASE STUDIES IN MINING GEOMECHANICS - II

Assessing Pillar Stability in Underground Stone Mines: Impact of Geological Structures and Stress Variations in the Appalachian Region.....	2016
<i>A. Elibol; D. Tuncay; Z. Agioutantis</i>	
Semi-Automated Geotechnical Workflow Utilizing UAV Data for Enhanced Hazard Assessment and Safety at Rio Tinto Kennecott.....	2024
<i>L. Fahle; K. M. Bakken; J. Telfer; C. Williams</i>	

VOLUME 4

Mixed-Reality Geotechnical Cell Mapping for Slope Stability Assessment at Rio Tinto Bingham Canyon Mine	2032
<i>K. B. A. Nihufu; B. Karen; F. Lukas; W. Chad; O. Emre</i>	
Reliability-Based Design (RBD) Updating by Sample Reweighting for Rock Slope Design.....	2041
<i>A. E. Aladejare; K. A. Idowu; T. M. Ozoji</i>	
Characterizing Rock Degradability as Basis for Slope Instability Mitigation for Open Pit Closure.....	2048
<i>T. G. Carter; L. J. Lorig; P. J. H. De Graaf</i>	
Numerical Analysis of Slope Stability in Open Pit Mining Based on an Integrated Geology and Geomechanics Approach	2068
<i>Z. Sun; G. R. Balasubramanian; A. Fager; B. Crouse; G. Barlow; M. Abouaali</i>	

PETROLEUM UNCONVENTIONAL - HYDRAULIC FRACTURING III - THEORETICAL AND NUMERICAL MODELING

Production Enhancement by Microproppants: Concept Proof Using Laboratory Experiment and Numerical Modeling.....	2076
<i>Yanhui Han; Feng Liang; Hui-Hai Liu</i>	
Enhancing Cluster Efficiency by Modeling Swelling Diverter Particles in PKN-Type Fractures.....	2084
<i>Bo Luo; George K. Wong</i>	
Optimization of Proppant Placements for Larger Propped Areas.....	2095
<i>Jiacheng Wang; Jon Olson</i>	

Quantifying Non-API Proppant Transport and Fracture Permeability as a Function of Solids Loading and Particle Shape	2104
<i>C. R. Leonardi; L. Laniewski-Wollk; N. J. Di Vaira</i>	
Probabilistic Distribution Model to Predict Fracture Height.....	2111
<i>M. Oyarhossein; M. B. Dusseault</i>	
The Energy Budget in Fluid-Driven Fracturing: A Continuum Damage Approach	2117
<i>Mostafa E. Mobasher; Haim Waisman</i>	

STORAGE & SEQUESTRATION - CO₂ UTILIZATION & STORAGE II

Caprock Stress Contrast Measurement, Mechanism Investigation and Development of Area In-Situ Stress Characterization, Northern Lights CCS, Offshore Norway	2129
<i>N. Thompson; R. Meneguolo; S. Rasmussen; P. Bautmans; H. Reitan; A. Stroisz; L. Cruz</i>	
Assessing Caprock Integrity Through Thermo-Hydro-Mechanical Modeling of CO ₂ in a Deformable Chalk Depleted Gas Reservoir	2139
<i>B. Hosseinzadeh; F. Amour; A. Abdollahi C. C.; M. R. Hajiabadi; C. A. S. Ferreira; H. M. Nick</i>	
Machine Learning Application for CCUS Carbon Storage: Fracture Analysis and Mapping in the Illinois Basin.....	2145
<i>G. Liu; A. Kumar; W. Harbert; H. Siriwardane; D. Crandall; L. Cunha</i>	
Numerical Simulation Applications for Optimizing Fiber Optics Strain Monitoring During Injection in Fractured Reservoirs.....	2152
<i>D. S. Eyinla; H. Emadi; H. B. Navaid; A. Arora; A. Kebir</i>	
Stress Variations Controlled by Rock Composition in an Appraisal Well in the US: Evaluating Lithology, Stress Measurements, and Methods	2165
<i>Leonardo Cruz; Solomon Jimba; Ralph Affinito; Zoya Husain</i>	
THMC Cement Initial State of Stress Model and Its Numerical Implementation for CO ₂ Storage Well Integrity Simulations.....	2174
<i>C. Joulin; T. Le Blevet; W. Kostorz; M. Perez-Fernandez; F. Bourgeois; M. O. Benmesbah</i>	

INTERDISCIPLINARY - NOVEL EVALUATION AND COMPUTATIONAL TECHNIQUES FROM LAB TO FIELD

Modelling Faults as Fracture Swarms to Introduce Multi-Scale Heterogeneity.....	2186
<i>S. A. Libby</i>	
Shear Band Development and Permeability Anisotropy Evolution in Fault Gouge	2192
<i>Q. Li; J. Y. Chen; C. Y. Zhang; F. S. Zhang; Q. Gan; D. Elsworth</i>	
Stress and Load Path Dependent Static and Dynamic Moduli and Ultrasonic Velocities in Granite	2200
<i>E. P. Knippel; C. Wu; Q. Xiong; A. P. Villaquiran Vargas; J. C. Hampton</i>	
A Modeling Study of Injection-Induced Rupture and Seismicity in Complex Faults	2209
<i>M. Cao; J. Rutqvist; Y. Guglielmi; H. Tounsi; U. Mital; A. Cihan; S. Glubokovskikh; M. Reagan; P. Jordan; J. Birkholzer</i>	
A 3D Subspring Network Breakable Voronoi Model for Rock: Laboratory-Scale Behavior	2216
<i>D. O. Potyondy; W. Fu</i>	

A Novel High-Stress Method to Measure Total Horizontal Stress in Mudrocks Subjected to Uniaxial Strain Loading and Unloading	2234
<i>Kiseok Kim; M. Mohamed Awad; D. Nicolas Espinoza</i>	

CIVIL - RISK ASSESSMENT, GEOHAZARDS, AND CONSTITUTIVE MODELING IN ROCK MECHANICS

Influence of Monitoring Time on Rockfall Magnitude-Frequency Uncertainty.....	2239
<i>C. Phillips; G. Walton</i>	
Investigation of the Frost-Induced Shallow Alpine Rockfall Process Using 3D FDEM	2250
<i>Lei Sun; Giovanni Grasselli</i>	
Development of a Prototype Thermal Imaging Rockfall Detection System.....	2254
<i>Julia Potter; Benjamin Meyer; Brad Ross; James McNabb; John Keefner; Chad Williams; Leonard D. Brown; Bobby Prescott; Albert Cabrejo</i>	
Effect of Joint Orientation on Rock Mass Erosion Based on Experimental Results Using a Pilot Plant Spillway Model	2261
<i>V. R. Karnati; A. Saeidi; A. Rouleau; M. Quirion</i>	
Numerical Analysis of Induced Mechanism of Rockbursts in Tunnels	2268
<i>J. Deng; Y. Gong; S. Li</i>	
Chemo-Mechanical Modeling of Anhydritic Claystones	2276
<i>A. N. Antonia Nousiou; G. A. Georgios Anagnostou</i>	

MINING - NUMERICAL MODELING FOR MINING APPLICATIONS

Simulating Large-Scale Supported Pillar Laboratory Experiments in 3DEC.....	2282
<i>A. Chaurasia; G. Walton</i>	
Numerical Modeling to Investigate the Influence of Jointing on Production Blast Fragmentation.....	2291
<i>P. C. Dare-Bryan</i>	
Sub-Level Caving Blast Modelling to Determine the Impact of Blast Design Parameters and Rock Mass Characteristics on Fragmentation.....	2303
<i>A. R. Khodayari; C. Xu; P. Dowd; P. C. Dare-Bryan; A. Metcalfe</i>	
Concept Feasibility and Predicted Behavior of Mining a Rock Tower with Drill-And-Blast Undermining Using Dynamic Three-Dimensional Discontinuum Numerical Models.....	2310
<i>R. Abousleiman; C. I. Contreras; J. Cremeens; T. Worsey; N. Rouse</i>	
Approximation of Stress Near Tunnel Intersections in Deep Burst-Prone Mines for Support Selection and Rockburst Hazard Assessment	2319
<i>A. Rigby; D. A. Malovichko; P. K. Kaiser</i>	
A Coal Pillar Burst Assessment Index Based on Numerical and Analytical Tools	2338
<i>C. Cardenas-Triana; V. Androulakis; Z. Agioutantis</i>	

PETROLEUM UNCONVENTIONAL - HYDRAULIC FRACTURING IV - EXPERIMENTATION, SIMULATION, AND FIELD RESULTS

Development of Hydraulic Fracturing Evaluation Techniques Using Chemical Adsorption Mechanics.....	2349
<i>Shang Zhang; Danzhu Zheng; Mengjiao Yu</i>	
Experimental Study of Underground Heat Storage Via Hydraulic Fractures	2357
<i>A. Möri; J. Naftalski; T. Liardon; M. Talebkeikhah; B. Lecampion; G. Lu; J. Burghardt</i>	
Back to Basics: Experimental Measurement of Liquid and Solid-Liquid Properties to Predict Hydraulic Fluid Behavior in Fractures	2367
<i>O. A. Aldajani; J. T. Germaine; H. H. Einstein</i>	
Experimental Study of Proppant Crushing and Conductivity Reduction Within Rough Fracture in Shale Gas Formations.....	2378
<i>L. Liu; X. F. Ma; Y. S. Zou; S. C. Zhang; X. H. Zhang; W. C. Wang; S. K. Liu</i>	
Numerical Modeling of Fluid-Driven Fractures in Permeable Media Using Symmetric Cohesive Elements	2387
<i>C. Mejía; J. Rueda; D. Roehl</i>	
Field Experiences of Near-Wellbore Poroelastic Effects and Benefits of Pump-Out in Microfrac in Unconventional Reservoirs	2394
<i>Souvik Sen; Prajit Chakrabarti; Javier A. Franquet</i>	

STORAGE & SEQUESTRATION - HYDROGEN STORAGE

Modification of the Rock Mechanical Design of Salt Caverns on the Basis of Recent Research	2400
<i>Dirk Zapf; Feline Körner; Bastian Leuger; Lukas Baumgärtel</i>	
Geomechanical Effects of Cyclic Loading on Rocksalt	2408
<i>M. E. Houben; A. J. Van Der Linden; K. El Azouzi; F. H. M. Marcelis; A. H. Coorn; R. Van Schalm</i>	
Evaluating Caprock Integrity During Underground Hydrogen Storage (UHS) in Subsurface Rocks	2417
<i>A. I. Ajibona; R. Pandey</i>	
Implications of Underground Hydrogen Storage on the Sealing Ability of Aged Cement	2428
<i>A. Hussain; H. Emadi; S. R. Thiagarajan; D. Maury Fernandez; I. Ispas; M. Watson</i>	
Effects of Underburden Fault Properties, Operational Properties, and Stresses on Induced Basement Fault Seismicity During Hydrogen Storage in Depleted Gas Fields	2435
<i>J. E. J. Burtonshaw; A. Paluszny; A. Mohammadpour; R. W. Zimmerman</i>	
Insights from Thermohydromechanical Simulations for Real-Time Monitoring of UHS in Saline Aquifers	2449
<i>E. R. Okoroafor</i>	

PETROLEUM CONVENTIONAL - AI/ML AND DATA SCIENCE

Enhancing Well Kick Classification in Drilling Operations Using a Novel PCA-Based Machine Learning Approach	2455
<i>Junzhe Wang; Haorong Jing; Evren Ozbayoglu; Silvio Baldino; Danzhu Zheng; Xiang Li</i>	

Estimating Well Specific Sanding from Numerically Generated Sanding Database	2463
<i>Yuxing Xiao; Hans Vaziri</i>	
Improve Mechanical Earth Model Calibration Using Statistical Concepts	2471
<i>P. Ray</i>	
Shale Anisotropy Made Simple	2476
<i>R. M. Holt; A. Bakk; S. Lozovyi</i>	
Predicting Strength Properties Applying Machine Learning Techniques for Highly Heterogeneous Microbial Limestones from Brazilian Pre-Salt Reservoirs	2483
<i>F. H. Ferreira; A. M. Borba; P. F. V. Garcia; E. S. R. Santos; F. O. L. Falcão</i>	
Machine Learning-Based Drill Bit Wear Prediction for Enhanced Drilling Performance	2497
<i>H. Khalifa; O. S. Tomomewo; B. Doghmane; B. E. Berrehal; M. K. Benabid</i>	

SHOWCASE - TUNNELING

Numerical Prediction of Thermo-Mechanical Spalling Around a Deep Nuclear Waste Repository in Crystalline Rock	2507
<i>Andrea Lisjak; Omid Mahabadi; Johnson Ha; Diego Mas Ivars</i>	
Tunnel Design and Construction in Ohio Shale Formation	2508
<i>Chi Park; Gregory Rogoff; Brad Murray</i>	
Tunneling in Alpine Fault Zones – Case Study Semmering Base Tunnel	2509
<i>Helmut Wannenmacher; Manuel Entfellner; Thomas Fiest; Wulf Schubert</i>	
Response to Movement Within an Open-Cut Rock Face: Case Study from Ottawa Light Rail Project, Ontario, Canada	2510
<i>Anna M. Crockford</i>	

SHOWCASE - FAULT MECHANICS

Meter-Scale Laboratory Earthquakes Triggered by Fluid Injection and the Role of Background Stress in Mediating Runaway Ruptures	2511
<i>Gregory McLaskey</i>	
Micromechanics of Sub-Critical Failure in a Porous Rock: Insights from Integrating Sound and X- Ray Vision	2512
<i>Alexis Cartwright-Taylor; Maria-Daphne Mangriotis; Ian G. Main; Ian B. Butler; Andrew Curtis; Florian Fousseis; Andrew F. Bell; Edward Andò; Martin Ling</i>	
Microscopic Defect Dynamics During a Brittle-To-Ductile Transition	2513
<i>Matej Pec; Hoagy O’Ghaffari; Ulrich Mok; Hilary Chang; Brian Evans; Yves Bernabe; Tushar Mittal; Andrew Cross</i>	
Simulating Induced Earthquakes in Complex Fault Systems	2514
<i>Kyungjae Im; Jean-Philippe Avouac; Taeho Kim; Linxuan Li</i>	

MINING - POSTERS TUESDAY - 1

A Numerical Solution to the Flow-Induced Vibration of a Hanging String in a Storage Cavern	2515
<i>J. D. Chieslar</i>	

Sonar Surveys/Nurb-Surfaces/Adaptive, Body-Fitted Meshing for Large-Scale Modeling of Multiple Solution Mines.....	2522
<i>J. D. Chieslar</i>	
Proactive Identification of Adverse Geological Structure in a Deep Mine Environment.....	2534
<i>A. Hall; S. Marshfield; B. Simser; L. Howell; J. Lindsay; M. Cai</i>	
Experimental and Numerical Investigations into Fracturing Process of Brittle Rocks.....	2543
<i>Babak Khadivi; Hossein Masoumi</i>	
A Comprehensive Comparison Between Discrete Fracture Network and Generalized Anisotropic Material Behavior for Modeling Jointed Rock Mass.....	2549
<i>B. H. Ko; S. Moallemi; H. K. Dang; T. Yacoub</i>	
Probabilistic Slope Stability Analysis Based on the Modified Stability Graph.....	2558
<i>C. Séguineau De Préval; A. Ouellet; P. Andrieux</i>	
A Brief Description About All the Steps Related to the Development of Lattice-Spring-Based Synthetic Rock Mass (LS-SRM) for Slope Stability Analysis	2567
<i>M. Paganin Neto; L. L. Rasmussen</i>	
A Comparative Study of Preparation Methods, Weighting Agents, and Temperature on Quality of E-M Compatible Borehole Imaging Fluid.....	2576
<i>L. Abbasian; O. M. Akindele; A. N. A. Abugharara; S. D. Butt</i>	
Intact Rock Properties of the Rotondo Granite for the PRECODE Project in the BedrettoLab	2583
<i>M. A. Perras; Y. Golabchi; N. Bahrani; P. Hamdi; F. Amann</i>	
Integrating Stress Fracturing and Bulking Monitoring for Deformation-Based Ground Support Design Calibration in a Deep Caving Operation	2590
<i>A. A. Primadiansyah; E. Eberhardt; R. Campbell; S. Firmanulhaq; H. Silaen; A. Perdana</i>	
Analysis of Rockfall Risk Using Image Analysis and Data-Driven Models	2604
<i>M. Ghahramanieisalou; J. Sattarvand; B. Abbasi; B. Peik; R. Battulwar</i>	
Tackling Data-Limited Rock Mechanics Models	2610
<i>H. Maleki</i>	
Case Study: Investigation, Analysis and Mitigation of Rock Instability for a Potential Slope Failure in Highly Weathered Granite at Pinto Valley Mine in Arizona.....	2618
<i>S. D. Ureel</i>	

MINING - POSTERS TUESDAY - 2

Analyzing the Effect of Bolt Spacing on Coal Rib Stability Through Numerical Simulation.....	2625
<i>Y. Xue; K. M. Mohamed</i>	
Geotechnical Hazards in Deep Mines: Case Studies of Seismicity and Boundaries Changes.....	2632
<i>R. T. Masethe; A. R. S. Leite; D. Landry</i>	
Effect of Cyclic Freezing and Thawing on Permeability and Mechanical Properties of Red Sandstone Under Triaxial Compression Condition	2641
<i>B. Liu; Y. Q. He; Y. H. Han; W. H. Li; J. Y. Zeng</i>	

Axial Stiffness Evolution of Rock Observed During Uniaxial and Triaxial Compression Strength Tests.....	2648
<i>S. Gaines; M. S. Diederichs</i>	
Thembelani and Khuseleka Mines in the Bushveld Igneous Complex's Western Limb in South Africa.....	2657
<i>R. Masethe; S. Durapraj; M. Modika; M. Ngwenya; A. Adoko; T. Zvarivadza</i>	
Chipping Mechanisms in Rotary-Percussive Drilling: Experimental Insights into the Role of the Median Crack as Precursor of the Dynamic Fragmentation Process.....	2667
<i>J. Aising; L. Gerbaud; H. Sellami; P. Senechal; P. Moonen; I. Ugarte</i>	
Numerical Simulation of Toppling Failure in Sedimentary Rock Slope Cuts with Alternating Soft and Hard Bands	2679
<i>M. Ashraf; M. Z. Emad; M. Waqas; H. Moazzam</i>	
Examining the Anisotropic Strength of Plain and Steel Fiber Reinforced Shotcrete.....	2688
<i>M. U. Khan; M. Waqas; M. Z. Emad; M. U. Tahir</i>	
Appraisal of Boreability Characteristics of Rocks to Estimate the TBM Advancement	2695
<i>S. Yagiz; A. Yazitova; G. Smirnov; Vinayak M. Thyagarajan; J. Hassanpour</i>	
Assessing the Variability in Direct Shear Testing Interpretation for Sets of Natural Fractures	2700
<i>M. A. Franco; J. Potter; B. Meyer</i>	

VOLUME 5

Methodology Development to Incorporate Anisotropy in Slope Stability Analysis at Los Bronces Mine®	2706
<i>M. Córdova; J. Vallejos</i>	
Numerical Analysis for the Design Assessment of Underground Mine Operations	2713
<i>G. Cammarata; T. A. Bui; S. Brasile</i>	
Development of Chilean Open Stope Empirical Stability Database Using MineRoc and Their Comparison with Literature.....	2721
<i>J. A. Vallejos; F. Retamal; A. Barberán; J. Velásquez</i>	

STORAGE & SEQUESTRATION - POSTERS TUESDAY

Geomechanical Analysis of Caprock Integrity and Fault Stability for Greensand CO2 Storage Project Feasibility	2733
<i>A. Younessi; E. Kårstad; P. Basu; M. Larsen; O. Burachok</i>	
Experimental and Numerical Validation of Cooling-Induced Stress Change Within a Caprock Shale – Seal Integrity Insights from the Northern Lights CCS Project	2741
<i>N. Thompson; L. Griffiths; T. I. Bjørnarå; H. Smith; J. S. Andrews</i>	
De-Risking Stress Testing Operations and Maximizing Injection Longevity.....	2751
<i>F. Karpfinger; A. Donald; A. Gisolf; P. Schlicht; I. Diaz Granados; E. Velez</i>	
SOSAT: Geohazard Risk Assessment in Carbon Sequestration Operations	2764
<i>R. Haagensohn; J. Burghardt; W. Wang; S. Saxena; D. Appriou</i>	

A Conceptual Subsurface Risk Management and Measurement, Monitoring and Verification Design for an Offshore Carbon Capture and Storage Site in Japan	2773
<i>K. Nii; S. Nakayama; A. Ohira; T. Ashida; K. Qiu; H. Lee; N. Wada; H. Yamabe</i>	
Experimental Study on Shale Mechanical Properties Interacted with Supercritical Carbon Dioxide and Brine	2788
<i>Jie Feng; Tianshou Ma; Yang Liu</i>	
Consolidation Behaviors of Clays, Mudstones and Shales -CO ₂ Storage Sites in Horda Platform, Offshore Norway	2796
<i>L. Grande; E. Skurtveit; J. C. Choi; N. H. Mondol; N. H. Mondol; N. Thompson</i>	
Injection from Well Experiments in Axisymmetric Triaxial Cells: Example of Hydraulic Fracturing	2805
<i>Y. Kovalyshen; J. Dautriat; L. Kiewiet; J. Sarout; B. Maney; S. Kager; I. Penny</i>	
Numerical Simulation of Long-Term Stability of Irregular Underground Salt Caverns Under Alternating Loads	2815
<i>Zhi Chang; Yan Xia; Kun; Dai; Tianen Liu; Qi Zhang; Fansheng Ban</i>	
Unveiling the Invisible: Mapping Basement Faults Using Microseismic Clouds	2821
<i>Chaoyi Wang; Christopher S. Sherman; Kayla W. Kroll; Stanislav Glubokovskikh; David Alumbaugh; Joseph P. Morris</i>	
Fault Leakage Risk Assessment Via Coupled Probabilistic Modelling During CO ₂ Sequestration	2829
<i>C. Sorgi; V. De Gennaro; P. Welsh</i>	
Crystallization Pressure and Reaction-Induced Cracking in Olivine Carbonation: Insights from Etch Pit Analysis	2840
<i>U. C. Iyare; C. W. Neil; L. Boampong; W. Li; M. Meng; L. P. Frash; J. W. Carey; H. S. Viswanathan; E. Detournay</i>	
Exploring the Potential and Geomechanical Implications of Underground Hydrogen Storage in the Broom Creek Saline Aquifer	2846
<i>A. Laalam; H. A. K. Chellal; H. Khalifa; A. Benarbia; O. S. Tomomewo; M. K. Benabid</i>	
Evaluation of Gas Flooding Effect in Mahu Tight Sandstone Reservoir	2856
<i>Z. W. Zhao; S. C. Zhang; Y. S. Zou; X. H. Zhang; D. Y. Zhu; S. K. Liu; P. Yang; L. Liu</i>	
Fully Coupled Thermal-Hydro-Mechanical Model for ScCO ₂ Storage in Shale Gas Reservoirs	2865
<i>Jianwei Tian; Jie Zeng; Yingfeng Sun</i>	
Cracking Behaviour of Mineralised Fractures Under Direct-Shear	2872
<i>Lie Kong; Junlong Shang</i>	
Evaluating Geological Seals for Underground Hydrogen Storage: A Comprehensive Assessment	2878
<i>Henry Galvis-Silva; Esuru R. Okoroafor; Kai-Wei Liu</i>	
Well Integrity Analysis During CO ₂ Injection in a Depleted Chalk Field	2886
<i>F. Amour; M. R. Hajiabadi; S. Hosseinzadehsadati; H. M. Nick</i>	
Leakage Pathways in Diatomite Formation: A Study of Overburden Dynamics and Fracture Network in Hydrocarbon Fields	2894
<i>M. R. Hajiabadi; H. M. Nick</i>	
Investigating the Effect of Fault Presence on the Feasibility and Limitation of Above Cap Rock Pressure Monitoring in the Inyan Kara, North Dakota	2899
<i>A. K. Chellal Hichem; Malki Mohamed Lamine; Sven Egenhoff</i>	

Coupled Reservoir-Geomechanics Simulation of CO ₂ Storage at the Wyoming CarbonSAFE Storage Hub	2907
<i>Tao Bai; Ying Yu; Zunsheng Jiao; Matthew Johnson; Charles Nye; J. Fred McLaughlin; Scott Quillinan; Li Peng</i>	

PETROLEUM CONVENTIONAL - POSTERS TUESDAY - 1

Log-Log Analysis for Compaction Damage Evaluation Caused by Pores Collapse in Depletion-Dependent Oil Reservoirs.....	2917
<i>F. B. Fernandes; E. Gildin; A. M. B. Braga; M. C. Duarte</i>	
Study on Wellbore Stability of the Intrusions in Manshen Block, Tarim Basin	2930
<i>Bin Tang; Zhi You; Haiyang Gao; Sen Liu; Guilin Xiao; Hongda Li; Yunhu Lu</i>	
A Graph-Based Drained Wellbore Stability Analysis in Mohr-Coulomb Rock Formation Under Hydrostatic in Situ Stress Field	2943
<i>X. Wang; S. L. Chen; Y. H. Han; Y. Abousleiman</i>	
Application of a Modified Warpinski Method for In-Situ Horizontal Stress Prediction Coupled with Thermal Effects	2951
<i>M. C. Duarte; F. B. Fernandes; E. Gildin; A. M. B. Braga</i>	
Study on RF Heating Mode of Heavy Oil Reservoir Rocks Based on Two Antenna Elements Distributed Along the Horizontal Well.....	2960
<i>Zhengxu Wang; Qingfeng Guo; Xiao Cai; Jingtian Zhang; Qing Zhao; Bo Li; Xuefeng Chen; Haiyang Gao</i>	
Modeling Erosion in Hollow Cylinder Tests: The Case of Low Pressure Under Variable Confining Stress	2967
<i>Panos Kakonitis; Loizos Papaloizou; Elias Gravanis; Ernestos Sarris</i>	
Equivalent Circulating Density Calculation After Gas Kick Considering Temperature and Pressure.....	2975
<i>Zhenxin Jiang; Zhenyu Tao; Zheng Wang; Wenbo Zhang; Yuhan Liu; Jitong Liu; Jing Fu; Honghai Fan; Lewang Sun</i>	
Prediction of Liquid Loading in Changning Shale Gas Well.....	2983
<i>Jia Li; Zeyin Jiang; Shuang Liu; Ming Wen; Na Li</i>	
In-Situ Horizontal Stress Inversion and Error Analysis Based on Borehole Deformation Monitoring	2988
<i>Jie Chen; Tianshou Ma; Yang Liu; Wen Xu</i>	
Modeling of Local and Macroscopic In-Situ Stresses of Salt Layer in the Tarim Basin	2995
<i>Yong Sheng; Ji Li; Huiliang Liu; Renkun Luo; Zhi You; Qing Zhan; Yunhu Lu; Shiming Wei</i>	
Analysis of Casing Damage Mechanism of Carboniferous Salt Layer in Tarim Basin	3000
<i>Hongjun Liang; Chenxing Huang; Hongde Qin; Renkun Luo; Qingshan Deng; Hui Lu; Qing Zhan; Yunhu Lu; Shiming Wei</i>	
Triaxial Rock Deformation Cell for Inside Micro-CT Scanner	3006
<i>A. Maartje Houben; A. Ab Coorn; A. Arjan Van Der Linden</i>	
Experimental Study on Wall Stability of Acid-Etched Fractures Carbonate Reservoir.....	3010
<i>X. D. Zhang; Jun Zhou; Zhou Zhou</i>	

PETROLEUM CONVENTIONAL - POSTERS TUESDAY - 2

Bentonite Prehydration and Its Impact on Cementing Job Execution	3015
<i>Idham Kholid Rahmatullah; Ahmed Abdulhamid Mahmoud; Salaheldin Elkatatny</i>	
Numerical Simulation Study on Multi-Directional Etching Connection in Acid Fracturing.....	3021
<i>Xiaoyang Wang; Qiuping Qin; Linbo Zhou; Xin Huang; Meizhu Zhang</i>	
Intelligent Optimization of Water Alternating Gas Flooding with Carbon Dioxide: A Win-Win Strategy for Enhancing Oil Recovery and Carbon Storage	3032
<i>Liang Zhang; Rui Deng; Bo Kang; Lian Wang; Xing Zhao; Bing Xu; Yanran Jia</i>	
A Study of the Collapse of Fractured Sandstone Strata Characterized by High In-Situ Stress Differences in Deep Formations	3040
<i>Zehao Xu; Wen Zhang; Xiangjun Liu; Lixi Liang; Yadong Jing</i>	
Experimental Study of Fluid Rheological Properties on the Friction of Cuttings Bed in the Horizontal Well.....	3044
<i>Mengmeng Zhou; Huanhao Wang; Hao Xiao; Xianzhi Song; Yiqun Qi; Haobo Wang; Liang Han; Shiming Duan; Zhengming Xu; Zhaopeng Zhu</i>	
Laboratory Study of Fracture Propagation Behaviors in Fractured-Cavity Carbonate Reservoirs in Shunbei Oilfield	3053
<i>Pandeng Luo; Chunyue Li; Yaoyao Sun; Zhongwei Huang; Xiaoguang Wu; Xu Zhang; Ruiyue Yang; Zikang Wang</i>	
Experimental and Numerical Investigation on the Fracture Characteristics of Different PDC Cutters Penetrating Limestone	3065
<i>Xinkang Fu; Zhongwei Huang; Zhuangzhuang Zhang; Guodong Ji; Jiawei Zhang</i>	
High-Performance Lightweight Cements: A Review	3072
<i>Stewart Matovu; Ahmed Abdulhamid Mahmoud; Talal Al Shafloot</i>	
Research and Application of Rock Mechanics Evaluation Method for Drill Cuttings in Complex Ultra-Deep Well.....	3080
<i>Long Chang; Haige Wang; Lubin Zhuo; Chen Hao</i>	
Comparing Compression and Shear Behavior of Intact and Resedimented Mudrock to Illuminate the Rheology of Mudrocks	3086
<i>A. R. Bhandari; R. T. Ewy; P. B. Flemings; J. T. Germaine</i>	
Numerical Approach to Evaluate Cements Sheath Barrier During Reservoir Compaction in Vertical Oil Wells.....	3091
<i>J. D. U. Velilla; S. A. B. Fontoura; D. D. E. F. Melo; J. J. V. Braga; R. Dias; C. S. Okama</i>	
Analysis of Influencing Factors of Fracturing Effect Based on Artificial Neural Network.....	3101
<i>C. Lu; J. H. Sun; Y. Li; M. Li; J. Q. Liu; Q. Y. Zhu; Q. Y. Li; Q. J. Zeng; S. X. Wang</i>	
Numerical Analysis of Dissolution Process on the Casing Design Integrity Near Salt Caverns	3110
<i>J. J. V. Braga; S. A. B. Fontoura; D. D. E. F. Melo; J. D. U. Vellila; R. Dias; C. S. Okama</i>	

GEOTHERMAL - POSTERS TUESDAY

- A Wellbore-Reservoir Coupled Model and Its Application in Sand Production Prediction During Sandstone Geothermal Exploitation3116
Hao Zeng; Youkeren An; Jinjian Liu; Yiqun Zhang; Khanjar Hasan; Yan Jin
- Granite Rock Mass Identification and Geothermal Well Location Deployment Based on the Wide Field Electromagnetic Method: A Case Study of Sanshui Basin 3122
Q. X. Zhang; Y. Zhang; J. Y. Feng; J. Luo
- Geological Analysis of Typical Geothermal Systems in East of China 3129
Jianyun Feng; Ying Zhang; Jun Luo; Yan Zeng; Xiaorui Yun; Dawei Liao; Zhiliang He; Ying Zhang; Jun Luo; Yan Zeng; Xiaorui Yun; Dawei Liao
- Uncovering the Influence of Divalent Ions on the Reinjection of Deep Geothermal Sandstone Reservoirs: A Case from Guanzhong Basin in China 3140
Wentong Zhang; Hai Huang; Xiongtao Shang; Weiyun Luo; Qian Gao; Jiahui Zhang; Xinru Li
- Geothermal Resource Evaluation Based on Geological Modeling in Fushan Sag, Beibuwan Basin 3145
Xiaorui Yun; Jianyun Feng; Ying Zhang; Yan Zeng
- Structural Deformation Characteristics and Geological Significance of the Mesoproterozoic Augen Granite Gneiss in Hainan Island, China 3151
Jianyun Feng; Xiaorui Yun; Jun Luo; Ying Zhang; Yan Zeng; Dawei Liao; Qiaoxun Zhang
- Laboratory Strategies to Evaluate Enhanced Geothermal Systems (EGS) in Scale Model Experiments..... 3157
A. P. Villaquiran-Vargas; N. Opperman; E. Knippel; Q. Xiong; C. Sutton; C. Zahasky; J. C. Hampton
- Laboratory Demonstration of Fracture Caging in a Fault with Calibrated Microseismic Monitoring 3167
Y. Madenova; W. Li; M. Meng; B. K C; L. P. Frash; J. Hampton
- Anelastic Strain Recovery as a Measure of in Situ Stresses at FORGE 3174
M. D. Ingraham; A. Ghassemi
- Design of a Meso-Scale Test of a Fracture Thermal Energy Storage (FTES) System..... 3180
J. Burghardt; B. Lecampion; A. Möri; D. Linneman
- Electrical Resistivity Tomography Based Monitoring of Stress Perturbations to Optimize Placement of High-Precision Strain Meters 3188
T. C. Johnson; J. Burghardt; G. E. Hammond; S. Karra; P. Jaysaval; K. Rosso; J. D. Hyman

INTERDISCIPLINARY - POSTERS TUESDAY

- An Innovative Combination of Scratch Test and Weibull's Statistical Fracture Theory 3193
Yazhou Zhang; Yan Jin; Xiuxia Sun; Ping Zeng
- A Review of the Anelastic Strain Recovery (ASR) Technique for In-Situ Stress Measurements: A Suggested Test Protocol and Further Challenges..... 3201
W. Lin; Y. Sakai; N. Kamiya; Y. Cao; K. Ishitsuka; D. Sun; C. Zhang; Y. Nagano

Hyperparameter Tuning of an Artificial Neural Network (ANN) for Laboratory Acoustic Emission Source Location.....	3208
<i>Q. Xiong; E. K. Johnson; C. S. Wu; J. C. Hampton</i>	
Characterization of the Accuracy by AIC Picking and Manual Picking with the Decaying of Event Magnitude.....	3216
<i>D. K. Kong; C. W. Wang; Q. Lin; Q. Xiong; E. P. Knippel; J. C. Hampton</i>	
Thermal-Mechanical-Chemical Coupling Analysis of Coal Rock in Underground Pyrolysis Conversion.....	3223
<i>Junjie Xue; Yanpeng Chen; Yufeng Zhao; Zhen Dong; Hao Chen; Shanshan Chen; Mengyuan Zhang</i>	
Study of the Stress State Around Dynamically Pressurized Underground Cavities in Porous Saturated Rock Formations and Its Implication for the Fracture Growth Analysis.....	3231
<i>O. Yu. Vorobiev; S. M. Ezzedine</i>	
Correlation of Static and Dynamic Mechanical Properties of Australian Sedimentary Rocks	3241
<i>Jimmy Xuekai Li; Shuai Chen; Sijin Qin; Thomas Flottmann; Yixiao Huang; Erfan Saber; Zhongwei Chen</i>	
Coupling Between Weathering and Fracture: Finite Element Modeling of Granite Weathering Using Cohesive Elements	3248
<i>Tingting Xu; Chloé Arson</i>	
Elastic Wave Behaviors Across Rocks Subjected to Cyclic Tensile Loads	3257
<i>Hui Yang; Dongya Han; Shan Wu; Qi Zhao</i>	
Where Does the Energy Go in Percussion Drilling? FDEM's Answer.....	3264
<i>X. Yang; J. Xiang; S. Naderi; Y. Wang; J. Latham; J. Aising; L. Gerbaud; I. Ugarte</i>	
Destruction of Rock Microstructure: An Experimental and Numerical Modelling Study of High-Pressure Water Jet Rock Cutting Under Subsurface Confining Pressure Conditions	3272
<i>X. Xiang; S. Naderi; J-P. Latham; L. Gerbaud; N. Velmurugan; I. Thenevin; H. Sellami</i>	
Application of Machine Learning Algorithms for Minerals Volume Prediction in Unconventional Reservoirs Using Conventional Well Logs.....	3284
<i>N. Bettir; I. Mellal; A. Dehdouh; M. Rabiei; M. L. Malki; L. Allam</i>	
Improved Shale Volume Prediction Using Machine Learning Algorithms in Complex Reservoirs	3293
<i>N. Bettir; A. Dehdouh; I. Mellal; A. Kareb; M. Rabiei</i>	
Measurement of Crack Tip Opening Displacement and Strain Fields Using Global Digital Image Correlation (DIC)	3302
<i>Tushar Bhandari; Debasis Deb</i>	

CIVIL - POSTERS TUESDAY

Damage Mechanism and Parameter Optimization of Rock Mass Blasting Under High In-Situ Stress.....	3310
<i>Xin Zhang; Xiang Xia; Haibo Li; Shuaiyang Fu</i>	
A Discussion of Traditional Rock Slope Stability Analysis Methods with a Technical Evaluation of a Former Quarry Site in Jessup, Pennsylvania	3319
<i>N. A. Fleischer; R. D. Thomas</i>	

Influence of Specimen Shape on New Simple Shear Test Using Rock Prism Specimen	3329
<i>I. Sato; Y. Togashi; H. Kotabe; K. Hatakeyama; M. Osada</i>	
Numerical Stress Computation Around Cavity Using Boundary Element Method for Elastic Material	3335
<i>A. Habibi</i>	
An Analytical Solution for Deep Circular Tunnels in Rock Based on GZZ Criterion.....	3341
<i>Haohua Chen; Hehua Zhu; Lianyang Zhang</i>	
Computational-Rock Mechanics in Pedagogy and Practice	3347
<i>R. Kayen; B. M. Russo</i>	
An Ontology of Risk Management for Tunnel Construction.....	3355
<i>Y. D. Xue; Y. C. Hou</i>	
Analysis of Convergence Confinement of Circular Tunnel by Supporting Elements Using Elasto-Plastic Solution of Ground	3361
<i>T. Nishimura; K. Kimura; T. Kawasaki; M. Kohno</i>	
Rockfall Occurrence and Precipitation Modeling to Simulate Correlation Patterns	3369
<i>Frances Williams; Gabriel Walton</i>	
Characterization of Geotechnical Properties of Phnom Penh Bedrock: A Case Study in Chrouy Chongvar and Dangkao Districts.....	3375
<i>S. Boeut; Y. Fujii; P. Sieng; S. Kaing; A. K. M. Badrul Alam; N. Z. Dzimunya; S. Oudom; S. Boeut</i>	

VOLUME 6

Design and Implementation of Innovative, Openable, In-Trench Rockfall Catchment Fences for Improvement of Worker Safety in Steep Slope Pipeline Construction.....	3382
<i>C. Hajen; L. Philip; J. Gesche; A. Burgin; J. Nichols; A. Bichler</i>	
CFD Simulation to Study the Grouting Behavior in Rough-Walled Fractures.....	3389
<i>T. Miyoshi; H. Yasuhara; K. Kishida</i>	

PETROLEUM UNCONVENTIONAL - POSTERS TUESDAY - 1

Study on the Mechanism of Wellbore Stability and Drilling Fluid Technology Countermeasures in Ultra-Deep Composite Salt Formations in the Tarim Basin	3395
<i>Zhen Zhang; Zheng Fang; Jiaxin Li; Yong Sheng; Bo Zhou; Li Zhao; Yunhu Lu</i>	
Hydration Impact on Pore Structure and Methane Adsorption in the Lower Silurian Longmaxi Shale of the Sichuan Basin	3402
<i>Duo Wang; Hang Yuan; Shuijian Wei; Xiao Li</i>	
Experimental Research on Fracture Propagation of Multi-Well Pad Fracturing Based on Distributed Strain Sensing.....	3411
<i>B. Zhang; T. K. Guo; M. Chen; L. R. Xue; Y. H. Zhang; Z. P. Hu; Z. Q. Qu</i>	
Development and Validation of a New Wellbore Stability Prediction Model for Complex Reservoirs: Application to the Keshen Gas Field in the Tarim Basin.....	3420
<i>Yingjun Liu; Chenggang Xian; Hui Zhang; Guoqing Yin; Ke Xu; Zhimin Wang; Shujun Lai; Jingrui Liang; Ziwei Qian</i>	

Analysis of Production Data from Multi-Fractured Shale Gas-Condensate Wells Coupled the Microscale Effects of Gas Transport	3429
<i>Wenpeng Bai; Shiqing Cheng; Dingning Cai; Qiao Guo; Xinyang Guo; Yang Wang</i>	
A Novel Model for Evaluating Temporary Plugging Effectiveness Between Clusters in Shale Gas Horizontal Wells	3436
<i>Le He; Li Zhan; Bin Qian; Bin Guan; Yong Ren; Mingzhong Chen; Jianfeng Qu; Yuhao Liu; Longqing Zou; Yao Zhang</i>	
Insights into Fracture Dynamics Through Advanced Coupled Flow and Geomechanics Modeling	3442
<i>Yanli Pei; Kamy Sepehrnoori</i>	
Study on Post-Fracturing Inter-Well Interference in Deep Shale Gas	3455
<i>Chen Wang; Haiyan Zhu; Xuanhe Tang; Mingyan He; Fansheng Kong; Danlong Li; Xiao He; Chaoyi She; Majia Zheng; Jianfa Wu; Bo Zeng; Haoyong Huang; Junfeng Li; Ersi Xu; Junchuan Gui</i>	
Numerical Simulation of Proppant Transport and Backflow in Unconventional Reservoir Hydraulic Fractures Based on CFD-DEM.....	3467
<i>Mingkun Lv; Tiankui Guo; Ming Chen; Xuliang Jia; Renjie Yang; Hui Jia; Zhanqing Qu</i>	
Simulation Study of Hydraulic Fracturing on Deviated Well Under Strike-Slip Stress Regime in Tarim Basin, China	3481
<i>Haifeng Fu; Bing Hou; Taixian Zhong; Hexiang Zhao; Bo Cai; Zhanwei Yang; Liao Wang; Dengfeng Ren; Jinhua Huang</i>	
Feasibility Evaluation of RF Heating Heavy Oil Reservoir Based on the Interaction Between Rocks and Electromagnetic Waves.....	3499
<i>Zhengxu Wang; Qingfeng Guo; Xiao Cai; Jingtian Zhang; Qing Zhao; Bo Li; Xuefeng Chen; Haiyang Gao</i>	
Development of Hydraulic Fracturing Evaluation Techniques Using Microchip Sensing System	3506
<i>Shang Zhang; Danzhu Zheng; Mengjiao Yu; Md Jakaria</i>	
Investigation on Mechanical Test and Fracture Propagation for Deep Coal.....	3517
<i>Jiayuan He; Xiaolong Li; Lei Wang; Danqiong Li; Xinliang Wang</i>	
3D Fracture Propagation Simulation of Shale Oil Reservoirs with Bedding Planes and Natural Fractures Development.....	3526
<i>H. Y. Wang; T. K. Guo; M. Chen; B. Zhang; J. W. Wang</i>	
Investigation on the Damage Mechanisms of Unconsolidated Sand, Tight Sand and Shale Induced by Cryogenic Temperature	3536
<i>Xuelin Zheng; Mingjing Lu; Dongying Wang; Qin Qian; Anhai Zhong; Liaoyuan Zhang; Feng Yang; Yuan Li; Yuzhe Zhang; Quansheng Su; Dawei Zhou; Min Zhang; Guangqing Zhang</i>	
Composite Proppants Sintered from Fly Ash and Their Application in Fracturing Tight Oil Reservoirs	3547
<i>Hongda Ren; Jingfeng Dong; Jingchun Zhang; Fangzhou Xu; Bin Wang; Tianbo Liang</i>	
Characteristic Analysis of Flow Field and Cuttings Removal of Straight-Swirling Integrated Jet During Tubing Cleaning	3555
<i>Yongjun Xiao; Jian Zheng; Chunlin Wu; Zhi Chen; Xin Luo; Bingxiao Liu; Yingqiao Ren; Haochen Huang</i>	

Numerical Simulation of Fracture Propagation on Proactive Utilization of Stress Interference in the Yingxiongling Shale Oil Reservoir.....	3563
<i>X. Chen; C. G. Xian; Y. Y. Liu; Y. Y. Wan</i>	

PETROLEUM UNCONVENTIONAL - POSTERS TUESDAY - 2

The Slipping Characteristics of Bedding Interface Under Shearing Stress in Unconventional Reservoirs.....	3572
<i>Lei Chen; Fengxia Li; Zhiwen Huang; Tong Zhou; Shijing Chen; Min Zhang; Guangqing Zhang</i>	
Fracturing Breakthrough and Comprehensive Evaluation of CP1 Well in Yingxiongling Shale Oil Reservoir, Qaidam Basin	3580
<i>Liu; Y. Y.; Xian; C. G.; Liu; Y.; Chen; X.; Zhang; M. Y.; W. Cao; Y. Y. Wan</i>	
Influence of Increasing Mean Stress on Rock Fatigue Fracture Characteristics and Failure Mechanism	3589
<i>Yanan Hou; Li Wang; Yishan Liu; Guangai Wu; Zhiming Yin; Junyan Wang; Baitao Fan; Yan Peng</i>	
Characterization of Water-Rock Interaction in Water-Sensitive Tight Oil Reservoirs and Its Mitigation Method with Pilot Tests	3595
<i>Bobo Xie; Bin Wang; Mingxing Wang; Jinchi Teng; Bingxian He; Tianbo Liang</i>	
MultiFracSimPPM: A Data-Driven Probabilistic Predictive Model for Hydraulic Fracture Growth from Uniformly and Non-Uniformly-Spaced Perforation Clusters	3603
<i>Andreas Michael; Chukwuemeka Kalu; Nassim Bouabdallah</i>	
Quantitative Evaluation of Controlling Factors of Nonuniform Production in Deep Shale Gas Based on Optic Fiber Logging Technology.....	3611
<i>S. R. Shao; H. Hu; Z. X. Yang; P. Tan</i>	
Coupled Wellbore-Reservoir-Geomechanics Modeling of Parent Well Depletion-Induced Stress Evolutions and Their Potential Impact on Infill Well Fracturing.....	3621
<i>Xuyang Guo; Yan Jin; Mian Chen; Hongwei Song</i>	
An Efficient Complex Fracture Network Inversion Method Through Adaptative Particle Filter Based on Quadratic Programming for 3D Shale Oil Reservoir	3629
<i>Guoxiang Zhao; Hongjun Lu; Yin Qi; Qiang Ni; Wenbin Chen; Liang Tao; Tongwu Zhang; Chen Xian; Caspar Daniel Adenutsi; Qi Liu</i>	
Dynamic and Static Biot's Coefficient of Transversely Isotropic Longmaxi Shale.....	3644
<i>Lichun Jia; Hu Deng; Qicong Xu; Wen Xu; Lei Li; Luchun Li</i>	
Sequential Propagation of Multiple Fractures in Horizontal Wells	3652
<i>Tianyu Wang; Yuning Yong; Jiaheng Zhai; Shouceng Tian; Xiaoxia Zhou; Mao Sheng</i>	
Non-Darcy Coefficient in Fractured Rocks	3660
<i>D. Cabrera</i>	
Lithology Identification of Deep Coal Seam Based on Machine Learning	3667
<i>An Qi; Yesong Li; Liu Hai; Zhang Feng; Yang Qi; Liu Hao; Lv Ningbo; Zhang Cheng; Li Hui; Fujian Zhou; Ben Li</i>	

Experimental and Numerical Investigation on Fracture Propagation Sensitivity Parameters in Deep Coal Seams	3674
<i>Wu Jian; Zhou Libo; Jiang Yao; Wang Yun; Yang Qi; Qian Chunjiang; Zhang Cheng; Lv Ningbo; Li Hui; Fujian Zhou; Ben Li</i>	
Optimizing Recovery in Unconventional Reservoirs by Advancing Fishbone Drilling Technology in the Bakken Formation, Williston Basin.....	3684
<i>A. Dehdouh; N. Bettir; H. Khalifa; A. Kareb; M. Al Krmagi</i>	
A Casing Force Prediction Method with a Missing of Cement Sheath Based on Cementing Displacement Efficiency.....	3695
<i>Jinlu Liu; Jun Li; Yingjie Li; Hui Li; Hongwei Yang; Gonghui Liu</i>	
Study on the Fracture Propagation Mechanism in Deep CBM Reservoirs.....	3702
<i>S. M. Wei; J. J. Shentu; Y. Jin; S. Y. Chen; B. C. Gao; F. Peng</i>	
Study on Fracture Initiation and Expansion of Coal Rock by CO ₂ Foam Fracturing	3708
<i>Yonggang Xie; Xu hao Fan; Changjing Zhou; Haizhu Wang; Zelong Mao; Bin Wang; Fengxiang Mao; Sergey Stanchits; Alexey Cheremisin</i>	
Productivity Prediction of Multilateral Horizontal Wells in Low-Permeability Gas Reservoirs Under Two-Phase Flow Conditions.....	3720
<i>Xinyang Guo; Shiqing Cheng; Wenpeng Bai; Dingning Cai; Zexuan Xu; Yang Wang</i>	

INTERDISCIPLINARY - INNOVATIVE ROCK TESTING AND THMC COUPLED PROCESSES

Seismic Investigation of Monotonic and Constant Pressure Hydraulic Fracturing Schemes in Granite	3727
<i>Awais Butt; Ahmadreza Hedayat; Omid Moradian</i>	
Geomechanical Properties of Hydrate-Bearing Sediments from the Gulf of Mexico - Viscoplastic Behavior	3736
<i>Alejandro Cardona; Athma R. Bhandari; Peter B. Flemings</i>	
Quantifying the Uncertainties of Macro- And Micro-Mechanical Measurements on Sequestration Reservoir Formations	3741
<i>Zhidi Wu; Eric Edelman; Kathleen Ritterbush; Brian McPherson</i>	
Experimental Study of the Effect of Porosity on EICP Biomineralization in Dolostone and Shales Under Uniaxial Compressive Stress Condition	3760
<i>M. C. Ngoma; O. Kolawole; O. Olorode; T.-H. Kwon</i>	
Assessment of Subsurface Ice-Based Thermal Energy Storage: THM Coupled Geomechanical Study.....	3768
<i>H. Tounsi; Y. Zhang; J. Rutqvist; J. Birkhozler</i>	
Helium Gas Release by Rocks Undergoing Crushing	3776
<i>W. M. Kibikas; M. J. Paul; J. E. Wilson; J. N. Kruichak-Duhigg; S. T. Broome</i>	

MINING - DEEP MINE STABILITY & INDUCED SEISMICITY

Micro-Seismic Monitoring in Mines Benefits and Limitations	3786
<i>D. B. Rebuli</i>	

Experimental Assessment of the Energy Dissipation and Deformation Capacity of Ground Support Systems Under Dynamic Loading: Insights from LaRonde Mine Dynamic Drop Test Program.....	3798
<i>C. Durham; M-E. Caron; V. Falmagne; R. Brändle</i>	
The Role of Thick Competent Strata in Face Bursting in Underground Longwall Mines.....	3814
<i>D. Chambers; M. S. Boltz; Z. Khademian; G. Walton; J. Shragge</i>	
Changes in Seismicity, Stress, and Stress Proxies Before and After the Large Seismic Event with Mw 4.2 on May 18, 2020 in Kiirunavaara Mine (Sweden).....	3826
<i>S. Dineva; C. Dahner; D. Beck; N. P. Agostinetti; D. Mihaylov; I. E. Guclu</i>	
Seismic Risk Management Practices at Vale's Sudbury Operations	3837
<i>M. Yao; D. Landry</i>	
Shifting Highwall Blast Vibration Frequencies Higher Maintaining PPV Lower from Near-Field Blasts	3843
<i>R. Yang; J. P. R. Proulx; A. Rodriguez</i>	

PETROLEUM UNCONVENTIONAL - GEOMECHANICS RESERVOIR CHARACTERIZATION I

Elastic Anisotropy in Bakken Formation.....	3852
<i>A. Mitra; A. Merzoug; S. Cobb; M. Mokhtari</i>	
Mechanical Upscaling in Highly Heterogeneous Rock Masses: Impact on Anisotropy and Subsurface Stress Prediction in the Bone Spring and Wolfcamp Formations of the Delaware Basin, USA.....	3860
<i>L. Cheng; B. R. Crawford; H. Chen; J. H. Macquaker; D. McLendon</i>	
A Thermo-Visco-Plastic Study of the Wolfcamp Shale: Experiments and Modeling.....	3871
<i>F. S. Rassouli; E. Haghighat; R. Juanes; M. D. Zoback</i>	
A New Apparatus to Measure the Coefficient of Friction and Changes in Fracture Permeability	3880
<i>Arun Sathyanath; M. Mukul Sharma</i>	
Permeability Test on Opalinus Clay Shale with a Preexisting Discontinuity	3888
<i>I. M. Arzuaga-Garcia; H. H. Einstein; C. Casagrande; H. M. Celleri; M. Sánchez</i>	
Strain and Stress Analyses Ahead of the Propagating Fracture Through Bedding Planes Using Digital Image Correlation (DIC)	3894
<i>Vishesh Bhadariya; Hunjoo P. Lee</i>	

STORAGE & SEQUESTRATION - WASTE DISPOSAL & STORAGE (NUCLEAR WASTE STORAGE & WASTE WATER DISPOSAL)

Laboratory Replication of Gas Mixture Transport in Fractured Porous Tuff Following a Subsurface Explosion.....	3905
<i>W. Li; B. Kc; M. Meng; L. P. Frash; C. W. Neil; P. H. Stauffer</i>	
Progressive Excavation Disturbance Zone Evolution During and Post Mine-By Tunneling (PRECODE) – Insight into a New Underground Research Laboratory for Crystalline Rocks in the BedrettoLab	3912
<i>P. Hamdi; P. Achtziger; J. Dickmann; M. Kruszewski; A. P. Rinaldi; L. Villiger; A. Shakas; M. Perras; N. Bahrani; D. Jiang; F. Amann; S. Wiemer</i>	

Implementation and Verification of Enhanced Munson-Dawson Creep Model for Rock Salt	3917
<i>Z. Cheng</i>	
Modeling of Thermo-Hydro-Mechanical Processes in a Bentonite Buffer Under High Temperature.....	3924
<i>R. A. Samarakoon; L. Zheng</i>	
Simulation of Coupled THMC Processes in Fractured Rocks Using a Dual-Media Approach.....	3932
<i>K. Mosley; L. Hartley; R. Turnbull; M. Cottrell; T. Bym; D. Mas Ivars</i>	
A New Finite Element Code for Thermo-Hydro-Mechanical Coupling in Geomechanics: Application to Deep Borehole Disposal of High-Level Radioactive Waste	3941
<i>H. Yoo; K.-B. Min</i>	

PETROLEUM CONVENTIONAL - DRILLING & COMPLETION: CASED HOLE

An Experimental Study on the Influence of Cyclic Loading and Eccentric Casing Geometry on Cement Sheath Integrity	3949
<i>Danzhu Zheng; Evren Ozbayoglu; Stefan Miska; Silvio Baldino</i>	
Hyper Fast THMC Well Integrity Simulator for Powering Optimization, Sensitivity and Risk Analysis.....	3960
<i>W. Kostorz; T. Le Blevec; C. Joulin</i>	
Use of Combined Analytical and Numerical Sand Production Prediction Methods to Define Simple Cut-Off for Sand Control and Well Completion Selection	3970
<i>A. Khaksar; A. R. Younessi; F. Likrama; F. Gui</i>	
Kinematic Analysis of Geomechanical Displacement Fields to Assess Lifetime Integrity of Wellbores.....	3978
<i>Udaya B. Sathuvalli; P. V. Suryanarayana; David B. Lewis</i>	
Mechanical Performance of One Latex Cement System for Thermal Storage Wells	3990
<i>M. Meng; T. Pytiana; L. Frash; K. Bijay; Y. Madenova; I. Uwaila; W. Li; W. Zhang</i>	
Solids Production Geomechanical Evaluation in a Fractured/Vuggy Carbonate Reservoir from Abu Dhabi Offshore Field: Postmortem Analysis and Advanced Finite Element Simulations	3998
<i>Hamid Pourpak; Kun Su; Christian Bikong; Hadi Rammal; Yann Bigno; Guifen Xi; Hamza Kheidri; Adam Bere; Jun Kato</i>	

SHOWCASE - MINING INDUSTRY ROCK MECHANICS

The Role of Major Geological Features in the Planning, Development, and Operation of Panel Cave Mines.....	4014
<i>Ryan Campbell</i>	
Geomechanical Practices in Developing Open-Pit Slopes at Kinross Gold	4015
<i>Jerry J. Ran</i>	
Managing Risks Associated with Mining Through the Wendy Stopes at the Candelaria Open Pit Mine	4016
<i>Marc Ruest; Jaime Campos</i>	
Rock Engineering at Kiruna Mine – the Change Journey	4017
<i>Matthias Wimmer</i>	

SHOWCASE - GOVERNANCE PERSPECTIVES ON CCS & GEOTHERMAL

Underground Injection Control (UIC) Class VI	4018
<i>Sharon Newman</i>	
DOE's Carbon Transport and Storage Program: Supporting Storage Infrastructure Build-Out Critical for Decarbonization	4019
<i>Gillian Rosen; Amanda Raddatz Bopp; Darin Damiani; Traci Rodosta; Rajesh Pawar; Robert Smith; Kevin Dooley</i>	
Drilling for Opportunities: The Geothermal Technologies Office.....	4020
<i>Kevin Jones; Lauren Boyd</i>	
Induced Seismicity in Geothermal Settings: Historical Perspective, Enhanced Geothermal Systems, Setbacks, and Future Directions	4021
<i>J. Ole Kaven</i>	

INTERDISCIPLINARY - APPLICATIONS OF AI IN EXPERIMENTAL, NUMERICAL, AND GEOPHYSICAL ROCK MECHANICS

AI-Driven Predictive Maintenance for Enhanced Reliability of Top Drive Thrust Bearings	4022
<i>A. Benarbia; S. Ghachi; H. Khalifa; O. S. Tomomewo</i>	
Improving Rock Excavation Efficiency Through Monitoring of Pick Cutter's Wear Condition	4030
<i>A. Morshedlou; I. Dagli; J. Rostami; O. Moradian; M. Belviranli</i>	
Predicting Rock Fluid Transport and Mechanical Properties Using Graph Neural Networks.....	4037
<i>J. Chung; R. Ahmad; M. Liu; W. C. Sun; W. Cai; T. Mukerji</i>	
Machine Learning Enhanced Interpretation of Wellbore Data for Underground Storage	4044
<i>N. Bondarenko; A. Ankul; R. Y. Makhnenko; P. Ganesh; S. Williams-Stroud; C. Goldberg</i>	
Predicting Excavation-Induced Damage Depth Through MLP	4051
<i>Y. Golabchi; M. A. Perras; U. T. Khan</i>	

VOLUME 7

Progressive Reduced Order Modeling: From Single-Phase Flow to Coupled Multiphysics Processes.....	4061
<i>Teeratrorn Kadeethum; Kyung Won Chang; John D. Jakeman; Hongkyu Yoon</i>	

MINING - FUNDAMENTAL ROCK MECHANICS, INSTRUMENTATION AND MONITORING IN MINING

Automation of Underground Void and Support Deformation Monitoring – Effective Decision- Making Data and Tools Without the Penalty in Time and Effort.....	4069
<i>J. Franke; C. Gonzalez</i>	
A Statistical Review of Rock Mass Classification with Some Surprising Results	4076
<i>E. C. Wellman; J. Kemeny</i>	
Strength Characteristics of Highly Anisotropic Burst-Prone Coal Considering Mineralogical Compositions.....	4086
<i>B. H. Kim; M. K. Larson</i>	

Dynamic Rock Testing and Implications for Blast-Induced Ground Vibration Mitigation	4095
<i>H. N. Tetteh; A. J. Rinehart; V. T. McLemore; W. F. Li</i>	

An Autoencoder-Based Deep Learning Model for Enhancing Noise Characterization and Microseismic Event Detection in Underground Longwall Coal Mines Using Distributed Acoustic Sensing Monitoring	4103
<i>A. Tourei; E. R. Martin; A. T. Ankamah; J. A. Hole; D. J. A. Chambers</i>	

Development of a Non-Destructive Stress Measurement Technique with Applications in Deep Mining Using Distributed Sensing	4112
<i>S. Hendi; E. Eberhardt; M. Gorjian; D. Stead</i>	

PETROLEUM - UNCONVENTIONAL - GEOMECHANICS RESERVOIR CHARACTERIZATION II

Permeability Evolution of Fractures in Shale in the Presence of High Salinity Water	4119
<i>T. Bai; N. Melkounian; S. Hashemi; A. Badalyan; A. Zeinijahromi</i>	

Effects of Interactions Between Produced Formation Fluid and Rock Matrix on Pore Structure of Caney Shale, Southern Oklahoma	4127
<i>Fengyang Xiong; Gabriel Awejori; Mileva Radonjic</i>	

Integrating Rock Physics Templates for Enhanced Seismic Interpretation: A Comprehensive Analysis of Influencing Factors on Frequency-Dependent Velocity of Tight Carbonate Formations	4135
<i>Mohamed L. Malki; Lotfi Allam; Ilyas Mellal; Abdeldjalil Latrach; Vamegh Rasouli; Anis Larbi; Hichem Chellal</i>	

Comparison of Geochemical Reactivity of Marcellus and Caney Shale Based on Effluent Analysis	4148
<i>L. B. Dje; G. A. Awejori; M. Radonjic</i>	

Reservoir Fine Evaluation of Horizontal Well Multi-Stage Fracturing Based on Unsupervised Cluster Machine Learning	4159
<i>W. C. Wang; X. F. Ma; Y. S. Zou; S. C. Zhang; L. Liu; P. Yang; Z. W. Zhao; A. Zheng; X. Wang; L. F. Yang</i>	

STORAGE & SEQUESTRATION - GEOMECHANICAL CHALLENGES IN UNDERGROUND STORAGE

Natural Sealing of Leaky Wells by Creep of Rocksalt	4168
<i>J. H. Terhegge</i>	

Evaluation of Caprock Integrity with Laboratory Scale In-Situ CO ₂ Injection Test	4179
<i>Kanitthorn Adisornsupawat; Anusarn Sangnimnuan; Porranut Rabiabpo; Sudarshan Govindarajan; Akshay Thombare; Deepak Gokaraju; Munir Aldin</i>	

Modeling of Thermal-Mechanical Impact on Wellbore Integrity Due to CO ₂ Injection	4187
<i>Zhuang Sun; Andrew Fager; Bernd Crouse</i>	

Tailoring Barrier Design Process to Assess Cement Integrity in CCS Wells	4196
<i>Jandhyala Siva Rama Krishna; J. Lewis Samuel</i>	

Generation of Micro-Fracture Clouds in Rocks: Mechanisms and Applications	4204
<i>U. Mutlu; G. Boitnott; A. Lisjak; O. Mahabadi; T. Sherizadeh; D. Guner; S. Nowak; A. Ghassemi</i>	

Mechanical Stability Analysis of Fracture-Cavity Carbonate Gas Storage	4224
<i>Huiying Tang; Xin Zheng; Xiaoping Wang; Zihan Zhao; Yuye Chen; Yulong Zhao; Liehui Zhang</i>	

PETROLEUM CONVENTIONAL - RESERVOIR GEOMECHANICS II - LAB EXPERIMENT

Stress-Permeability Characterization and Proposal of Creep Model for Pre-Salt Carbonates Under Lab-Scale Stepwise Hydrostatic Loading and Unloading	4236
<i>P. F. V. Garcia; E. S. R. Santos; D. F. Rossi; F. H. Ferreira; A. M. Borba</i>	
Use of Minifrac and PVC Data to Constrain Re-Pressurization Stress Path	4245
<i>J. Zhang; S. Edwards; R. Majidi; K. Mahadev; G. Duvivier</i>	
Experimental Investigation of Chalk Influx in a Depleted Reservoir.....	4252
<i>M. H. Bhuiyan; E. Papamichos</i>	
Poroelastic Properties of Indiana Limestone	4259
<i>A. Kalbekov; M. Naumann; L. Duranti; M. Prasad</i>	
Strength Characterization and Empirical Correlations for Carbonate Rocks from the Brazilian Pre-Salt Reservoirs.....	4270
<i>R. V. Sampaio; G. L. Righetto; S. A. B. Fontoura; C. Lima; M. Naumann</i>	
Sand Rate in Gas Flow	4278
<i>E. Papamichos; M. Varkas; L. E. Walle; A. N. Berntsen</i>	

MINING - POSTERS WEDNESDAY - 1

Sensitivity Analysis of a Dynamic Subsidence Prediction Model for Longwall Extraction.....	4286
<i>E. Maldonado; J. D. Romero Benitez; Z. Agioutantis</i>	
Laboratory Procedure to Calibrate Non-Stressed Borehole Size.....	4294
<i>C. Lin; D. H. S. Zou</i>	
Case Study of Program-Assisted Q-System Rating Based on Point Cloud Analysis	4300
<i>C. C. Chiu; C. Y. Liu</i>	
Effect of the Stress Regime on Injection-Induced Seismicity	4309
<i>Y. Xiao; Y. Haitao</i>	
Laboratory Study on the Strength Deterioration Characteristics of Solid Potash Ore Samples in Moist Environment.....	4315
<i>J. W. Zhang; S. Wang; S. L. Yang; X. Chen; W. J. Wei; L. H. Li</i>	
Calibration of Rockmass Failure Criteria for Mines Using Seismic Monitoring Data.....	4322
<i>D. A. Malovichko; A. Rigby</i>	
Exploring Ground Penetrating Radar (GPR) Simulation for Imaging and Determining Electromagnetic Wave Velocity in Volcanogenic Massive Sulfide (VMS) Deposits	4336
<i>L. Abbasian; S. D. Butt</i>	
Coupled Numerical Simulation of Coal Failure Caused by Thermal Impacting in Underground Coal Gasification Zone	4346
<i>Yufeng Zhao; Mengyuan Zhang; Yanpeng Chen; Zhen Dong; Hao Chen; Shanshan Chen; Junjie Xue; Heinz Konietzky</i>	

Tight Filling Challenges - Comparing Uncoupled and Coupled Backfilling of Underground Stopes with Cemented Paste Backfill.....	4354
<i>R. L. Veenstra; M. W. Grabinsky; B. D. Thompson</i>	
Digital Representation of Microstructures of Cretaceous Formation Rock Cuttings in the Tarim Basin.....	4363
<i>H. Liang; J. Q. Luo; T. Wen; H. Yan; W. X. Feng; Y. Jin; Y. Xia</i>	
Comparison of European (EN) and American (ASTM) Abrasion Resistance Test Standards on Some Igneous and Carbonate Origin Natural Stones Subjected to Foot Traffic.....	4370
<i>I. S. Buyuksagis; A. Cakir; M. Gursoy; J. Rostami</i>	
Evolution of Seismicity at Malmberget Mine.....	4377
<i>K. Jonsson; S. Dineva</i>	
Utilizing Coseismic Strain in the Modelling of Tunnel Loading in Deep Burst-Prone Mines	4385
<i>D. A. Malovichko; A. Rigby; P. K. Kaiser</i>	

MINING - POSTERS WEDNESDAY - 2

Rockburst Damage Characterization in a South African Gold Mine Subjected to High Horizontal Stresses	4403
<i>R. Masethe; G. Wienand; A. C. Adoko; T. Zvarivadza</i>	
Analyzing Shale Gas Well Casing Deformation in Pittsburgh Seam Longwall Chain Pillars: A Case Study Integrating Numerical Methods and Field Monitoring.....	4411
<i>I. B. Tulu; P. Zhang; D. Su; Z. Khademian; B. H. Kim</i>	
Assessment of Ground-Support Interaction Using Continuum Grain-Based Models	4417
<i>S. Sinha; G. Walton; D. Shirole</i>	
On Sweet Spot in Percussive Drilling: Single Impact Experiments	4429
<i>J. V. Borges Dos Santos; T. Richard; Y. Kovalyshen</i>	
Seismic Monitoring Systems in Mines, Where Are We Today?	4438
<i>S. Meyer</i>	
Time-Dependent Fracturing in Granite Under Uniaxial Compression	4448
<i>S. Zafar; A. Hedayat; O. Moradian</i>	
Simulating Li-Ion Extraction: A Reservoir-Scale Feasibility	4459
<i>M. Mura; M. M. Sharma</i>	
Experimental and Numerical Investigations on Fully Grouted Instrumented Rock Bolts Subjected to Pull Load	4468
<i>J. V. Modi; D. Deb</i>	
Stability Analysis of a Tunnel Nearby Folded Strata Using Numerical Modeling	4476
<i>H. Ali; M. Shahzaib; M. Z. Emad; M. Waqas; W. Ijaz</i>	
AI-Powered Semi-Automated Trace Detection Techniques on 3D Digital Rock Mass Models.....	4481
<i>S. Mehrishal; J. Kim; J.-J. Song</i>	
Enhancing Joint Detection and RQD Estimation in Acoustic Televiewer Imaging Through Automated Instance Segmentation and Deep Learning.....	4487
<i>N. Houshmand; K. Esmaeili; S. Goodfellow</i>	

Strategic Design and Analysis of Yielding Pillars: A Case Study from Deep Underground Mining at Vale's Copper Cliff Mine	4494
<i>M. McBride</i>	

STORAGE & SEQUESTRATION - POSTERS WEDNESDAY

Cyclic Loading-Unloading Impacts on Salt Cavern Stability: Implication for Underground Hydrogen Storage.....	4504
<i>Kyung Won Chang; Tonya S. A. Ross</i>	
Salt is Not a Steady-State Creep Material	4509
<i>J. D. Chieslar</i>	
Parameter Study on Crystalline and Sedimentary Rock for High-Level Radioactive Waste Disposal Considering the Geological Characteristics of the Korean Peninsula	4517
<i>D. S. Cheon; J. Y. Park; K. W. Jin; H. Lee</i>	
Hydraulic Crack Propagation and Rock Permeability Under Osmotic Pressure Gradients with Implications for Deep CO ₂ Sequestration and Fraccing	4523
<i>Zdenek P. Bazant; Anh Tay Nguyen; Houlin Xu; Pouyan Asem; Joseph F. Labuz</i>	
The Influence of Burial History and Capillary Suction on Geomechanical Properties of Clay Shales	4528
<i>L. Winhausen; G. Gaus; M. Jalali; F. Amann</i>	
Thermal Measurements and Geothermal Gradient from Deep Boreholes in the Revell Batholith, Northwest Ontario	4535
<i>H. A. Kasani; A. Desroches; E. Sykes; A. Parmenter; M. Khorshidi</i>	
Subsurface Migration of Signature Noble Gases for Underground Nuclear Explosion Detection.....	4545
<i>B. K C; M. Meng; W. Li; L. P. Frash; C. W. Neil; P. H. Stauffer</i>	
High-Temperature Performance of Compacted Bentonite Blocks for High-Level Nuclear Waste Repository: A Study of Desiccation Crack Control and Gas Permeability with Glass Microfiber Reinforcement	4552
<i>D.-H. Noh; S. Kim; J. Eun; Y.-R. Kim</i>	
Multiphysical Testing and Computational Modeling of Microfiber-Reinforced Bentonite Clay for Geological Repositories of Nuclear Spent Fuel.....	4557
<i>Abdullah Azzam; Mohammad Rahmani; Yong-Rak Kim; Jongwan Eun; Seunghee Kim</i>	
Geomechanics Finite Element Modelling for Nuclear Waste Storage.....	4564
<i>A. Mohamad-Hussein; Q. Ni; M. Haas; V. De Gennaro; S. K. Subbiah; A. Rodriguez-Herrera</i>	
Experimental Investigation of CO ₂ -Brine Simultaneous and Alternate Injection: Implications for Geomechanics and CO ₂ Storage Capacity	4574
<i>S. Eytayo; M. Watson; I. Ispas; O. Kolawole; D. Moronkeji</i>	
Understanding Hydrogen Flow in Depleted Natural Gas Reservoirs	4583
<i>Palash Panja; Eric Edelman; Carlos Vega-Ortiz; Rasoul Sorkhabi; Milind Deo</i>	
The Mechanical Response and Sealing Characteristics of Caprock During CO ₂ Injection in Depleted Reservoirs.....	4593
<i>Qianqian Ren; Bing Yang; Hai Huang; Junbin Chen; Yong Zheng; Dongqiang Zhou</i>	
Effect of Thermal Cycling on Cemented Sandstone in Relation to CCS.....	4602
<i>H. Smith; M. Soldal; L. Grande; L. Griffiths</i>	

Assessment of Leakage Risk of Legacy Wells Based on Wellbore Schematics Using a Systematic Approach	4609
<i>I. Anwar; M. Meng; W. J. Carey; P. Stauffer; G. Lackey</i>	
Numerical Investigation on the Effect of Different Interlayers Collapse Sediments on Safety of Gas Storage in Salt Cavern	4616
<i>Peng-Zhi Pan; Altaf Hussain</i>	
Reference Stress Solution and Benchmark of Thermo-Poro-Elastic Modelling of Cooling Effects Induced by CO ₂ Storage in Depleted Reservoirs	4623
<i>Kun Su; Frédéric Bourgeois; Ghislain Pujol; Arthur Moncorgé; Jian Huang</i>	
Probabilistic Analysis of Compressed Air Energy Storage Cavern Stability Considering Rock Mass Property Uncertainties	4632
<i>Hui Lu</i>	
A New Geomechanical Modeling Workflow for CCUS Near-Well Integrity Assessment in Layered Poroelastic Medium.....	4639
<i>Guang Zhai; Elisabeth Peters; Thibault Candela</i>	
Geomechanical Lessons from Oil and Gas Produced Water Injection Towards Subsurface Carbon Dioxide Sequestration	4647
<i>G. G. Ramos; John McLennan; Ion Ispas; Sidney Green</i>	
Tensile Strength of Serpentinized Harzburgite.....	4657
<i>Pouyan Asem; Zdenek P. Bažant; Juerg Matter; Joseph F. Labuz</i>	

PETROLEUM CONVENTIONAL - POSTERS WEDNESDAY - 1

Casing Force Analysis During MPC Waiting Setting Stage Considering the Cement Hydration and Heat Release Process	4662
<i>Jinlu Liu; Jun Li; Yingjie Li; Hui Li; Hongwei Yang; Gonghui Liu</i>	
Drilling Design and Optimization Technology for Ultra Deep Wells in Tarim Oilfield: A Case Study of Well Take-1, the Deepest Well in Asia	4669
<i>Wang Chunsheng; Feng Shaobo; Zhang Zhi; Zhou Bo; Wang Xiaoliang; Lv Xiaogang; Liu Jinlong; Zhou Bao</i>	
Finite Element Modeling of Frictional Contact Between a Blunt Tool and Rock with Anisotropic Damage.....	4676
<i>Yaneng Zhou; George Z. Voyiadjis</i>	
An Efficient Coupled Hydro-Geomechanical Model for Determination of Open Hole Extended Limit of Drilling Horizontal Wells in the Permian Basin by Using Developed Environmentally Friendly High Performance Water-Based Mud	4685
<i>Mohamed Metwally; Emmanuel Gyimah; Abdul-Muaizz Koray</i>	
Research on Prediction Methods of Mud Loss Risk Based on Different Seismic Attributes	4700
<i>Xing Fu; Renjun Xie; Changsuo Zhou; Xiaojian Wan; Yangjie Song; Xin Zhang; Yunhu Lu</i>	
Identifying the Robust Machine Learning Models to Cement Sheath Fatigue Failure Prediction	4708
<i>Danzhu Zheng; Junzhe Wang; Haorong Jing; Evren Ozbayoglu; Baldino Silvio; Md Jakaria</i>	
A Four-Pressure Profile Prediction Method for Horizontal Wells in Conglomerate Formations	4718
<i>Mingfei Yan; Yan Jin; Yunhu Lu; Zongyu Lu</i>	

Research on the Spatial Distribution of Drilling Resistance Characteristics in Mahu Shale Formations.....	4725
<i>Zhehua Yang; Zongjie Mu; Shouceng Tian; Jiangang Shi; Yury Popov</i>	

VOLUME 8

Inversion of Creep Rate of Salt Rock Using Finite Element Method Based on Engineering Data	4734
<i>Ji Li; Yunhu Lu; Shiming Wei; Chenxing Huang; Hongda Li; Qing Zhan</i>	
Geological Feature Extraction and Data-Driven Production Prediction Based on Well Logging Data.....	4739
<i>Maoya Hsu; Zhengchao Ma; Shouceng Tian; Xiaoxia Zhou; Jiacheng Dai; Jintao Weng; Tianyu Wang</i>	
A Model of Open-Hole Extension Limit of Horizontal Extended-Reach Wells in the Cold Sea Area of the Arctic	4746
<i>Gengchen Li; Xuyue Chen; Ming Jin; Xiaohua Cao; Mingchi Zhu; Rong Wang</i>	
Numerical Simulation of Wellhole Stability in Cretaceous Fractured Water-Sensitive Formation in Tarim Basin	4756
<i>Bao Zhou; Ping Zeng; Jun Chi; Kaifeng Xu; Hui Lu; Yang Xia; Yan Jin</i>	
Experimental Study on Permeability and Desorption of Tectonic Coal Under Mechanical Vibration	4763
<i>K. C. Li; B. Hou; Z. W. Zhai</i>	
The Two-Phase Flow of Oil-Gas Multiple Rounds Injection-Production in the Reconstructed of Gas Storage with Oil-Ring Condensate Gas Reservoir	4769
<i>Qi Liu; Yuedong Yao; Lian Wang</i>	

PETROLEUM CONVENTIONAL - POSTERS WEDNESDAY - 2

Improving Plugs Selection for Single-Stage Triaxial Tests with Micro-Rebound Hardness	4775
<i>Hector Gonzalez; Salem Algarni; Ahmed Algroos</i>	
Research on the Prediction Method of ROP Based on Improved BP Neural Network.....	4785
<i>Wengzhe Li; Lianbin Xia; Yueyao Luo; Yuechun Wang; Beiqiao Meng; Tianyi Tan; Lifan Luo</i>	
Measuring Hydraulic Fracture Propagation and Closure in Sandstone	4792
<i>M. Talebkeikhah; S. Momeni; B. Lecampion</i>	
Viscosity Based Classification of Displacing Process in Horizontal Annular Cementation.....	4801
<i>Zhuangzhuang Zhang; Xinkang Fu; Shuailin Li; Mao Sheng; Zhongwei Huang</i>	
Numerical Simulation on Fracture Propagation Behaviors in Grid-Like Fractured Carbonate Reservoirs in Shunbei.....	4811
<i>Xiongwei Liu; Bing Zhao; Zikang Wang; Yaoyao Sun; Xiaoguang Wu; Xu Zhang; Wenchao Zou</i>	
Optimizing Red Mud/Class G Cement Mixture for Lightweight Cement Slurries.....	4819
<i>Ahmed Abdulhamid Mahmoud; Salaheldin Elkatatny</i>	
Characterization of Carbonate Rock Fragmentation Under Torsional Impact Loading.....	4825
<i>Zhaohui Xu; Ran Ji; Jinzhao Fan; Huaizhong Shi; Chao Fang; Dong Liu; Yongqi Wang; Shaobo Song</i>	

Partial Replacement of Saudi Class G Cement with Red Mud for 15.8 Ppg Cement Slurries	4832
<i>Ahmed Abdulhamid Mahmoud; Abdulmalek Ahmed; Ahmed Alsabaa; Salaheldin Elkatatny</i>	
Drilling Data Based Approach for Real-Time Gamma Ray Prediction in Surface Holes Using Artificial Intelligence.....	4838
<i>Amir Shokry Youssef; Salaheldin Elkatatny; Abdulazeez Abdulraheem</i>	
New Understanding of Non-Uniform Propagation Mechanism of Horizontal Fractures in Shallow High-Permeability Reservoirs and Research on Main Controlling Factors.....	4843
<i>Yan Qiao; Yang Zhang; Litao Shang; Xidi Chen; Zhao Chen; Fan Lei; Jie Bai</i>	
Data-Driven Rock Mechanics Parameter Calculation Through the Integration of EPBP and OSDU: A Case Study	4853
<i>Hanqing Wang; Meng Han; Xiaobin Zhang; Xiaomei Kang; Zhimin Bai; Jin Meng; Dongwei Zhang; Yujie Zhou; Tianrui Ye; Ji Chang; Han Wang; Yitian Xiao; Xudong Sun</i>	
A Novel Evaluation Method of Double Sweet Spots in Shale Oil Reservoirs: A Case Study	4859
<i>Pengcheng Ji; Haiyan Zhu; Zhaopeng Zhang; Xiao He; Chaoyi She; Majia Zheng; Junbei Song; Dajiang Wang; Yuanzhao Li</i>	
Thermal Contribution in Fault Stability Assessment During Fluid Injection: Improvement of the Analytical Probabilistic Approach of an In-House Tool.....	4867
<i>S. Petroselli; A. Stiz; M. Brignoli; S. Monaco; F. Marton; D. Grilli; G. L. D. Facchi; F. Bottazzi; S. Mantica</i>	

GEOTHERMAL - POSTERS WEDNESDAY

Formation Model of Granite Geothermal System in the Fujian, Guangdong and Hainan Provinces in Southeast China.....	4874
<i>Jianyun Feng; Ying Zhang; Herong Zheng; Jun Luo; Yan Zeng; Xiaorui Yun</i>	
Nucleation of Instability on Granitoid Faults Under Hydrothermal Conditions: Implications for Fluid Injection-Induced Seismicity	4884
<i>Rui Huang; Fengshou Zhang; Mengke An; Derek Elsworth</i>	
Fluid Geochemical Genesis of the Rehai High Temperature Geothermal System in the Southeast Himalayas.....	4895
<i>Dawei Liao; Yingchun Wang; Yinlei Hao; Jianyun Feng; Ying Zhang</i>	
Analysis of Mechanical Properties and Failure Modes in Thermally Treated Granite with Structural Defects.....	4903
<i>Zheng Yang; Yike Dang; Shangtong Yang; Xiaoyu Liu</i>	
High Temperature Triaxial Direct-Shear Testing for FORGE and Field Scale Implications.....	4914
<i>L. P. Frash; U. C. Iyare; B. K C; M. Meng; M. Smith; K. Kroll</i>	
Poroelastic Stress Cycling and Microseismic Activity at the San Emidio Geothermal Field, NV (USA)	4924
<i>H. F. Wang; H. Sone; M. Cardiff; H. Guo; C. Thurber; X. Luo; K. L. Feigl; C. Sherman</i>	
Evolution of Hydraulic Fracture Permeability in EGS Considering Natural Fracture Compressibility and Strength of the Surrounding Rock	4933
<i>M. L. McLean; D. N. Espinoza; B. Ahmmed</i>	

Numerical Analysis of Fracture Propagation Behavior in Hard Rocks Subjected to Radial Borehole Fracturing Based on the Combined Finite-Discrete Element Method	4941
<i>Wenchao Zou; Zhongwei Huang; Zikang Wang; Xiaoguang Wu; Xu Zhang; Zixiao Xie; Kun Li; Pengpeng Huang; Hui Tan; Xinyu Qin</i>	
Research on Fracture Characteristics of Supercritical CO ₂ Fracturing Hot Dry Rock Based on THMD Coupling	4949
<i>Mingsheng Liu; Haizhu Wang; Xu Zhang; Xuhao Fan; Bin Wang; Ganghua Tian; Yonggang Yi; Sergey Stanchits; Alexey Cheremisin</i>	
Borehole Stability Analysis for an Injection Well in Superhot Rock Drilled with Millimeter Wave Technology	4960
<i>J. W. Porlles; M. D. Houde; J. Yao; J. Batir; H. Soroush; A Madayarov</i>	

INTERDISCIPLINARY - POSTERS WEDNESDAY

Effects of Epidote and Chlorite on the Frictional Stability of Granite Faults: Implications for Seismicity in Deep Geothermal Reservoirs	4971
<i>Mengke An; Fengshou Zhang; Rui Huang; Derek Elsworth</i>	
Seismic Data and Prediction of Mud Loss Risk Based on Physical Information Constraints	4980
<i>Renjun Xie; Changsuo Zhou; Xing Fu; Xiaojian Wan; Yangjie Song; Xin Zhang; Yunhu Lu</i>	
Deep Learning for S-Wave Arrival Time Picking in Acoustic Emission Source Location Analysis	4988
<i>Q. Xiong; E. K. Johnson; C. S. Wu; J. C. Hampton</i>	
A Training Experiment on the Cost and Benefit of Training U-Net for Laboratory Signal Processing.....	4996
<i>A Kong; C. Wang; Q. Lin; X. Qiquan; N. Opperman; C. Wu; E. P. Knippel; J. C. Hampton</i>	
Evaluating the Data Augmentation on Acoustic Emission (AE) Signals for Training a Deep Neural Network	5004
<i>D. K. Kong; C. W. Wang; Q. Lin; Q. Xiong; C. S. Wu; E. P. Knippel; N. D. Opperman; J. C. Hampton</i>	
Westerly Granite Study of Physical and Transport Properties Monitored by P and S Waves on Spherical Samples: Effect of Temperature and Hydrostatic Pressure.....	5014
<i>T. Lokajicek; D. Rimnácová; M. Petružálek; R. Prikryl; V. Natherová; M. Racek; A. Aminzadeh</i>	
Analysis of Machine Learning Models for Prediction of Petrophysical Data	5023
<i>C. Vega-Ortiz; P. Palash; E. Edelman; B. J. McPherson; G. Maxwell; D. List</i>	
Quantifying Anisotropic Viscoelastic Parameters Using In-Situ Pressuremeter Testing in Shale	5033
<i>L. Liu; M. Trzeciak; X. Xie; R. Chalaturnyk</i>	
Machine Learning (ML) Model for Blasting and Seismic Event Classification on Chilean Copper Mines	5039
<i>J. R. Otaíza; O. Jimenez; M. Vera; R. Sartori</i>	
Investigating Mechanical and Acoustic Properties of 3D Printed Materials: A Focus on Printing Orientation.....	5046
<i>Ghoulem Ifrene; Prasad Pothana; Sven Egenhoff; Neal Nagel; James Hickey</i>	
Artificial Neural Network for the Prediction of Unconfined Compressive Strength of Ultra Lightweight Cement for Oil and Gas Wells.....	5054
<i>A. D. Addo-Yobo; A. Hussain; H. Emadi; E. Maslowski De Moraes; M. Watson</i>	

Experimental Investigation and Modeling of Geomechanical Behavior for Methane Hydrate-Bearing Sediments.....	5063
<i>M. S. Rao; S. Wani; R. K. Kandasami</i>	

CIVIL - POSTERS WEDNESDAY

Rock Mechanical Characterization of Epoxy-Based Grouted Sandstone.....	5071
<i>F. Oppong; O. Kolawole; O. M. Olorode</i>	
Engineering Geological Hazards Along Doroud-KhorramAbad Railway Rock NATM Tunnels.....	5079
<i>Sadegh Tarigh Azali; Hanan Samadi; Jafar Hassanpour; Jamal Rostami; Mohammad Hossein Hamidishad</i>	
Investigation of the Effect of Confinement on Intact Wombeyan Marble Using Continuum Grain-Based Model (CGBM)	5090
<i>P. V. Satheesh; D. Shirole; S. Sinha</i>	
Experimental Investigation of Damage Evolution and Strain Fields of 3D-Printed Rock-Like Specimens Based on X-Ray Computed Micro-Tomographic Imaging and Digital Volume Correlation.....	5099
<i>Yulong Shao; Jineon Kim; Jae-Joon Song; Chen He</i>	
A 3D Continuum-Based Voronoi Tessellated Model (VTM) for Hard Rocks	5105
<i>F. Hamediazad; N. Bahrani; S. Moallemi; T. Yacoub</i>	
Mode I Fracture Behavior of Lightweight Concrete Made of Mine-Tailings-Based Aggregates	5112
<i>M. Asadizadeh; A. Hedayat; L. Tunstall; M. Taboada Neira; J. A. Vega González; J. W. Verá Alvarado</i>	
Visualization of Roughness Indices in Amplitude-Frequency Space from Wavy Simulated Profiles	5120
<i>R. Gray; N. W. Hudyma; B. C. S. Chittoori; M. M. McLaughlin</i>	
Confinement Effect on Operating Limits of TBM Based on a Theoretical Model for Rock Indentation.....	5127
<i>Hongwei Yang; Wenjie Liu</i>	
Underground Space Design Using DFN-Based Tools: Comparisons of Static Kinematic Block Stability Vs Distinct Element Modelling Assessments.....	5132
<i>J. Wang Ng; E C. J. Button; J. Z. Ye</i>	
Application of Novel Structural Finite Elements Implemented Within Combined Finite-Discrete Element Methods.....	5140
<i>A. Padilla; Z. Lei; A. Munjiza; E. Rougier; E. E. Knight</i>	
TBM Tunnelling Under Adverse Geological Conditions: Case Study of a Long-Distance and Deep-Buried Water Conveyance Tunnel.....	5146
<i>Wei-Qiang Xie; Xiao-Ping Zhang; Xiao-Li Liu; Rui-Peng Qian; Quan-Sheng Liu</i>	

PETROLEUM UNCONVENTIONAL - POSTERS WEDNESDAY - 1

Surrogate-Based Hydraulic Fracture Propagation Prediction Using Deep Neural Network Proxy	5160
<i>Fan Li; Yayun Zhang; Cong Xiao</i>	

A Simplified Finite Element Algorithm and Coupled THM Problems in Stress-Sensitive Naturally Fractured Reservoirs During Injection/Production.....	5174
<i>Yarlong Wang</i>	
New Understanding of Matrix-Fracture Dual Media Reservoir Damage Based on Pressure-Controlled Fracturing	5183
<i>Yang Zhang; Yan Qiao; Shiling Zhang; Hongjun Wu; Jie Bai; Xudong Guo; Senmu Li</i>	
The Determination of Elastic Properties of Laminar Shale Based on Adaptive Threshold Algorithm of Image Segmentation Technology	5191
<i>Zhengxin Sun; Yan Jin; Xuyang Guo; Jiaqi Luo</i>	
Prediction of Formation Pressure Relief by Using Neural Network	5198
<i>Yanchao Li; Yanfang Gao; Shijie Shen; Dengke Li; Zupeng Chen; Xuelin Liang</i>	
Effects of Loading Rate on Plastic and Damage Zones in Mode-I Crack Tip of Sandstone	5205
<i>Dawei Zhou; Guangqing Zhang; Bin Sun; Pengxu Xie; Mingjing Lu; Dongying Wang; Yuan Li</i>	
Monitoring the Propagating Process of Hydraulic Fracture with Fiber Optic Strain and Strain Rate Technology	5211
<i>Yalong Hao; Mian Chen; Su Wang; Changjun Zhao; Yu Mao</i>	
Gas Production Prediction Model and Parametric Analyses for Fractured Horizontal Well in Deep Coalbed Methane Reservoirs.....	5216
<i>Yanran Jia; Juntai Shi; Changjiang Ji; Xianyu Xiong; Hongxing Huang; Ming Chen; Wei Wang</i>	
Numerical Simulation of Shallow Conductor-Soil Displacement Characteristics in Deep Water Drilling	5228
<i>Minghe Zhang; Jin Yang; Haige Wang; Longlian Cui; Qi Liu; Lulin Kong; Ke Sun; Wanting Jia</i>	
Numerical Study on Influencing Factors of Breakdown Pressure in Perforated Horizontal Wells in the Mahu Tight Reservoir	5235
<i>Wenting Jia; Jianye Mou; Xiaowei Li; Shicheng Zhang; Lifeng Wang; Yajun Xu</i>	
Evolution of Proppant Embedment and Its Impact on Shale Permeability.....	5242
<i>Sijin Qian; Mingyuan Lu; Jimmy Xuekai Li; Yixiao Huang; Zhongwei Chen; Luming Shen</i>	
Numerical Simulation of Damage Evolution and Fracture Propagation in Deep Shale by Liquid Nitrogen.....	5250
<i>Xu Liu; Ying Liu; Hai Qu; Zhijun Zeng; Zhitian Lu; Shi Wang; Xiaodong Liu</i>	
Investigation of Ball-Sealer Transport and Diversion in a Horizontal Wellbore Based on Machine Learning	5260
<i>Zhijun Zeng; Ying Liu; Hai Qu; Xu Liu; Shi Wang; Zhitian Lu; Xiaodong Liu</i>	
LSTM Recurrent Neural Network Based Method for Identification of Drilling Operating Conditions and Its Application	5267
<i>Changchang Chen; Guodong Ji; Hongyuan Zhang; Yuqi Sun; Qiang Wu; Zehao Lv</i>	
Numerical Investigation of Multiple Non-Planar 3D Fracture Propagation and Proppant Transport in Horizontal Wells	5275
<i>Yang Peng; Zhang Shicheng; Zou Yushi; Ma Xinfang; Zhang Xiaohuan; Liu Li; Wang Wenchao</i>	

Experimental Study: Evaluating the Effect of Low High Viscosity Friction Reducer Concentrations to Transport Proppant Across Static and Dynamic Models	5285
<i>Ghith Biheri; Abdulmohsin Imqam; Shari Dunn-Norman; Khaled Elmaleh</i>	

PETROLEUM UNCONVENTIONAL - POSTERS WEDNESDAY - 2

Experimental Study on CO2 Fracturing of Continental Shale with Dense Laminas	5293
<i>Xiaohuan Zhang; Shicheng Zhang; Yushi Zou; Xinfang Ma; Dong Xiong; Li Liu; Peng Yang; Danyang Zhu</i>	
Pore Pressure Prediction in Deep Complex Formations Based on Well-Seismic Combination	5301
<i>Zixuan Yang; Chenxi Ye; Qian Wang; Wenbao Zhai; Peng Tan; Zhaowei Chen</i>	
Multi-Interbedded Continental Shale Reservoir Evaluation and Fracturing Practice	5307
<i>Bian Xiaobing; Gao Yuan; Li Shuangming; Xiao Bo; Zhang Shikun; Liu Xing; Zuo Luo; Kao Jiawei</i>	
New Method of XRF/XRD Based Mineralogy for Estimating Matrix-Modulus, Biot's-Coefficient and Effective-Stress Using VRH and HS Bounds of Rock Physics Principles	5311
<i>Umesh Prasad; P. Nora Alarcon; Javier Franquet</i>	
Study on the Mechanism of Wellbore Stability and Drilling Fluid Technology Countermeasures in the Ultra-Deep Fractured Formation of Southwest Tarim Depression	5319
<i>Zheng Fang; Mian Chen; Jiaxin Li; Yingxi Zhang; Zhen Zhang; Weizhen Ma; Yunhu Lu; Wansheng Wang</i>	
Discrete Element Analysis of Wellbore Stability Mechanisms in Broken Formations	5326
<i>Hongjun Liang; Zheng Fang; Zhen Zhang; Mingfei Yan; Jiaxin Li; Bo Zhou; Li Zhao; Yunhu Lu</i>	
An Efficient Hydraulic Fracturing Fracture Network Connectivity Evaluation Method Based on Point Cloud Pattern Recognition	5332
<i>X. Liu; Z. Chen; X. D. Zhang; G. Y. Zhong; S. M. Li</i>	
Numerical Simulation of Ground Subsidence Due to Oil and Gas Extraction from Creeping Reservoirs	5338
<i>S. Y. Li; J. Y. Zhao; J. Q. Li; M. J. Li; H. G. Wang; H. P. Guo</i>	
Numerical Study of the Proppant Transportation in the Nonplanar Fracture	5347
<i>S. Y. Chen; Y. Jin; S. M. Wei; D. Xu; W. D. Zhou</i>	
Effect of Fluid Rheology on Sand Production: Comprehensive Study	5354
<i>Sagyn Omirbekov; Balnur Zhaidarbek; Yerlan Amanbek</i>	
Role of Landing Point Selection and Completion Optimization in Stacking and Staggering Decisions – a Multi Domain Integration from Geology to Engineering	5360
<i>Santhosh Narasimhan; Steve W. Van Delinder; Tom A. Hewett; Nelson Suarez Arcano; Olubiyi Olaoye; Pukar Mainali</i>	
Evaluation of Fracturing Fluid Impact on the Productivity of Multi-Stage Fractured Marcellus Shale Horizontal Wells	5370
<i>Mohamed El Sgher; Kashy Aminian; Samuel Ameri</i>	
An Assessment of Hydraulic Fracture and Geomechanical Properties on the Compaction and the Productivity of Marcellus Shale Horizontal Wells	5376
<i>Mohamed El Sgher; Kashy Aminian; Samuel Ameri</i>	

Experimental Investigation of Crack Propagation in High Carbonate Shale.....	5384
<i>Xudong Zhang; Xiaoyang Wang; Linbo Zhou; Xin Chang; Yintong Guo; Xinao Zhang</i>	
Optimization of Fracturing Parameters for Channelized Tight Sandstone Gas Reservoir Development with Surrogate Models	5391
<i>Huiying Tang; Yingying Ni; Shangui Luo; Cheng Du; Honglin Xiao; Minghua Hou; Liehui Zhang</i>	
Experimental Study of Fracture Propagation of CO ₂ Fracturing in Conglomerate Reservoirs.....	5400
<i>Jie Li; Jingfeng Dong; Bin Wang; Peiyao Zhou; Gensheng Li; Changhui Zeng; Fengjuan Zhang; Kaixin Liu; Xiang Ding; Li Kun Wang</i>	

Author Index