SPE Journal

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Machine Learning Applications

1722–1738

SPE-205346-PA (Direct to Peer)

Analytical and Machine-Learning Analysis of Hydraulic Fracture-Induced Natural Fracture Slip

P. Zhao and K. E. Gray

1739–1758

SPE-205347-PA

Machine-Learning-Assisted Segmentation of Focused Ion Beam-Scanning Electron Microscopy Images with Artifacts for Improved Void-Space Characterization of Tight Reservoir Rocks

A. Kazak, K. Simonov, and V. Kulikov

1759–1772

SPE-205349-PA

Rescaling Method for Improved Machine-Learning Decline Curve Analysis for Unconventional Reservoirs

B. Li, T. C. Billiter, and T. Tokar

1773–1799

SPE-205365-PA (Direct to Peer)

Machine Learning for Deepwater Drilling: Gas-Kick-Alarm Classification Using Pilot-Scale Rig Data with Combined Surface-Riser-Downhole Monitoring

Q. Yin, J. Yang, M. Tyagi, X. Zhou, X. Hou, N. Wang, G. Tong, and B. Cao

1800–1811

SPE-205376-PA (Direct to Peer)

Flow-Based Characterization of Digital Rock Images Using Deep Learning

N. J. Alqahtani, T. Chung, Y. Da Wang, R. T. Armstrong, P. Swietojanski, and P. Mostaghimi

1812–1823

SPE-205479-PA (Direct to Peer)

AI-Based Estimation of Hydraulic Fracturing Effect

A. S. Erofeev, D. M. Orlov, D. S. Perets, and D. A. Koroteev

1824–1836

SPE-205485-PA (Direct to Peer)

Prediction of Field Saturations Using a Fully Convolutional Network Surrogate

K. Zhang, Y. Wang, G. Li, X. Ma, S. Cui, Q. Luo, J. Wang, Y. Yang, and J. Yao

1837–1857

SPE-203980-PA (Direct to Peer; Special Issue Paper)

A Recurrent Neural Network–Based Proxy Model for Well-Control Optimization with Nonlinear Output Constraints

Y. D. Kim and L. J. Durlofsky

Enhanced Oil Recovery

2148–2166

SPE-200624-PA

A Crucial Role of the Applied Capillary Pressure in Drainage Displacement

D. Arab, A. Kantzas, O. Torsæter, S. Akarri, and S. L. Bryant

2167–2188

SPE-205355-PA (Direct to Peer)

Scaling Up Low-Salinity Waterflooding in Heterogenous Reservoirs

H. Al-Ibadi, K. Stephen, and E. Mackay

2189–2202

SPE-205358-PA (Direct to Peer)

The Optimal Initiation Timing of Surfactant-Polymer Flooding in a Waterflooded Conglomerate Reservoir

Z. Liu, Y. Li, X. Chen, Y. Chen, J. Lyu, and M. Sui

2203–2213

SPE-205363-PA (Direct to Peer)

Effect of Clay Type on Emulsion Formation in Steam and Solvent Steamflooding

T. Kar and B. Hascakir

2214–2230

SPE-201754-PA

Surfactant-Aided Low-Salinity Waterflooding for Low-Temperature Carbonate Reservoirs

Y. Shi, C. Miller, and K. Mohanty

2231–2244

SPE-205381-PA (Direct to Peer)

Flow Physics of Polymer Nanospheres and Diluted Microemulsion in Fractured Carbonate Reservoirs: An Investigation into Enhanced Oil Recovery Mechanisms

H. Su, F. Zhou, Q. Wang, F. Yu, R. Dong, C. Xiong, J. Li, and T. Liang

2245–2270

SPE-205382-PA (Direct to Peer)

Temperature-Dependent Irreducible Water Trapping in Heavy-Oil Reservoirs

D. Ji, S. Wu, B. Wang, Z. Li, F. Lai, Z. Chen, M. Dong, and C. Ge

2271–2286

SPE-195318-PA

In-Situ Combustion Frontal Stability Analysis

Z. Zhu, Y. Liu, C. Liu, and A. R. Kovscek

2287–2304

SPE-205399-PA (Direct to Peer)

Simulation of Foam Enhanced-Oil-Recovery Processes Using Operator-Based Linearization Approach

X. Lyu, D. Voskov, J. Tang, and W. R. Rossen

2305–2317

SPE-205486-PA (Direct to Peer)

Experimental Study of Microgel Conformance-Control Treatment for a Polymer-Flooding Reservoir Containing Superpermeable Channels

Y. Zhao, J. Leng, B. Lin, M. Wei, and B. Bai

2318–2323

SPE-201513-PA

Role of Intermolecular Forces on Surfactant-Steam Performance into Heavy Oil Reservoirs

L. Y. Seng and B. Hascakir

2324–2339

SPE-205490-PA (Direct to Peer; includes Supplementary Material)

Effect of Dynamic Contact Angle on Spontaneous Capillary-Liquid-Liquid Imbibition by Molecular Kinetic Theory

W. Tian, K. Wu, Z. Chen, L. Lai, Y. Gao, and J. Li

2340–2351

SPE-205491-PA (Direct to Peer)

Reducing Residual Oil Saturation: Underlying Mechanism of Imbibition in Oil Recovery Enhancement of Tight Reservoir

G. Xu, Y. Han, Y. Jiang, Y. Shi, M. Wang, and X. Zeng

2352–2363

SPE-205339-PA (Direct to Peer)

Improved Calculation of Wellblock Pressures for Numerical Simulation of Non-Newtonian Polymer Injection

I. Tai, M. A. Giddins, and A. Muggeridge

Phase Behavior Studies

2364–2379

SPE-201341-PA

Phase Equilibria of Acid-Gas Aqueous Systems (CO_2, H_2S, CH_4, Water) and In-Situ pH Measurements in Application to Top-of-Line Corrosion

B. Dindoruk, R. R. Ratnakar, and S. Suchismita

2380–2396

SPE-205353-PA (Direct to Peer)

Phase Behavior and Physical Properties of Dimethyl Ether/Water/Heavy-Oil Systems Under Reservoir Conditions

D. Huang, R. Li, and D. Yang

2397–2416

SPE-205499-PA (Direct to Peer)

Simple and Robust Algorithm for Multiphase Equilibrium Computations at Temperature and Volume Specifications

C. Lu, Z. Jin, H. Li, and L. Xu

Pressure and Rate Transient Analysis

2417–2439

SPE-190841-PA

Pressure-Transient Behavior of Double-Porosity Reservoirs with Transient Interporosity Transfer with Fractal Matrix Blocks

A. Valdes-Perez and T. A. Blasingame

2440–2467

SPE-199015-PA

The Partial Transformational Decomposition Method for a Hybrid Analytical/Numerical Solution of the 3D Gas-Flow Problem in a Hydraulically Fractured Ultralow-Permeability Reservoir

G. Moridis, N. Anantraksakul, and T. A. Blasingame

2468–2478

SPE-205390-PA

A Complement to Decline Curve Analysis

R. D. Hazlett, U. Farooq, and D. K. Babu

Editorial Notes

Increased Issue Size. The August issue of *SPE Journal* offers a selection of 50 papers, with primary focus on the topics of machine learning applications and enhanced oil recovery. We will continue to include up to 20 additional papers in the last issues of 2021 to facilitate our transition to a new production vendor as well as to ensure timely publishing of papers. We will return to the standard issue size of 30 papers in 2022.

Journal Impact Factors. Clarivate Analytics released the 2021 Journal Citation Report (JCR) in June and once again it reflects a positive trend for SPE journals in the most recent impact factors: *SPE Journal* (3.478), *SPE Reservoir Evaluation & Engineering* (2.250), *SPE Production & Operations* (1.894), *SPE Drilling & Completion* (1.500). While it is important not to overly depend on impact factors for research assessment, the JCR has a reputation of excellence and integrity for its meticulous selection of top journals.

In Scopus, *SPE Journal* ranked No. 12 out of 195 journals in Geotechnical Engineering and Engineering Geology (placing it in the 98th percentile for its subject area). In addition, the journal currently has a time to first decision of 29 days and a CiteScore of 7.8.

Special Issues. SPE periodically publishes special issues of its journals that are devoted to topics of significant current interest in the upstream oil and gas industry. In the past, special issues replaced a regular issue of a journal, but the model has been updated to reflect real-time compilation. This means papers slated for a special issue will publish online as an article in press to be later paginated into a regular issue of the journal. At the same time, these papers will be compiled in the order of publication to OnePetro under their special issue topic. The first special issue under this new model—2021 SPE Reservoir Simulation Conference Special Issue—is in progress and accepted papers are available for viewing in *SPE Journal*. To learn more about the model and process, visit OnePetro.

Executive Summary

In this new issue, *SPE Journal* publishes 50 papers with an excellent cross-section of the latest developments in our field. The majority of these papers fall under the heading of machine learning applications, demonstrating how the area continues to evolve in importance and relevance to oil and gas upstream operations. As these papers demonstrate, powerful and adaptive predictive models based on machine learning protocols are becoming ubiquitous and *SPE Journal* is bringing you the latest developments in this arena. Another important topic featured in this issue is enhanced oil recovery, which contains the second largest number of papers. We also present novel and important insights in the areas of phase behavior and pressure and rate transient analysis. Overall, the 50 papers in this issue are organized in four general categories: Machine Learning Applications (23 papers), Enhanced Oil Recovery (21 papers), Phase Behavior Studies (3 papers) and Pressure and Rate Transient Analysis (3 papers).

It always gives me pleasure to write this: *SPE Journal* remains strong. Just last year, I wrote to you indicating that the journal had exceeded the 3.0 impact factor mark and has recently officially achieved a ~30-day time-to-first-decision average. This year, we continue to climb in impact factor (3.478 vs. 3.372 of last year) while maintaining excellent time-to-first-decision metrics. We remain in the 98th percentile (#12/195) in the Scopus rank in the Geotechnical Engineering and Engineering Geology category. For this trajectory of excellence to be maintained, we will always need you. Please continue to submit your top and most prized scientific contributions. And thanks for delivering! As you may have noticed, we have expanded the number of papers to 50 for this issue, from our usual of 30, to accommodate the excellent quantity of high-quality papers we continued to receive. Please join me in thanking all authors for their efforts in bringing their very best insights to you.

And do not forget: Please consider volunteering as a member of our editorial review team as a technical reviewer or an associate editor. While applications in all areas of expertise are welcome, our greatest needs continue to be found in areas of data analytics, drilling and completions, and production engineering. Keep in mind that for associate editor applications, the prospective applicant must have 10+ years professional expertise in any of the areas mentioned above and covered by the journal. Those interested in volunteering as an associate editor can contact any one of the journal's executive editors or the SPE Peer account at peer@spe.org.

I hope you enjoy the wealth of information that we bring in this new issue, and do not hesitate to reach out if you would like to volunteer on our editorial team. We look forward to hearing from you.

Luis F. Ayala, *SPE J.* Executive Editor,
Pennsylvania State University, University Park, PA