

## PREFACE

The 2022 International Symposium of the Society of Core Analysts (SCA), founded in 1986, is a chapter - at -large of the Society of Petrophysicists and Well Log Analysts (SPWLA) . In 2022, the symposium was held in Austin, TX, between September 19 and 23, featuring a workshop on “Core Analysis in Carbon Geosequestration, Geothermal, and Nuclear-Waste disposal” and various technical sessions showcasing 33 oral presentations, 14 posters with manuscripts and 17 posters. The symposium theme was “Augment Core Analysis to Embrace Energy Transition”

The collection of articles published in the SHS Web of conferences consists of fifteen (15) articles prepared for oral presentations. Thirty-one (31) proceedings presented in this symposium, published in other journals, and seventeen (17) posters are not included in this collection. Here is the list of papers no included in this collection.

### **Papers presented at the 2022 SCA Symposium published in other journals**

**Displacement Stability Revisited – A New Criterion for the Onset of Viscous Fingering**  
*J. G. Maas, N. Springer, A. Hebing, and S. Berg*

**Advanced Digital-SCAL Measurements of Gas Trapping in Sandstone**  
*Y. Gao, T. Sorop, N. Brussee, H. van der Linde, A. Coorn, M. Appel, and S. Berg*

**Wireless Acquisition for Resistivity Index in Centrifuge – Wiri: A Comparative Study of Three Pc-RI Methods**  
*Q. Danielczick, A. Nepesov, L. Rochereau, S. Lescoulie, V. De Oliveira Fernandes, and B. Nicot*

**Unraveling Electrokinetics – A Brand New and Innovative Workflow for the Quantification of Electrokinetic Properties of Siliciclastic Rocks**  
*Matthias Halisch, Stephan Kaufhold, and Christian Weber*

**Analytical Models for Predicting the Formation Resistivity Factor and Resistivity Index at Overburden Conditions**  
*M. Nourani, S. Pruno, M. Ghasemi, M. M. Fazlija, B. Gonzalez, and H-E Rodvelt*

**THz Imaging to Map the Microporosity Distribution in Carbonate Rocks**  
*Shannon L. Eichmann, Jacob Bouchard, Hooisweng Ow, Doug Petkie, and Martin Poitzsch*

**Innovations in Low UCS Core Acquisition and Quality Assessment Using Digital Rock Physics**  
*D. Lakshatanov, J. Cook, Y. Zapata, D. Saucier, R. Eve, M. Lancaster, N. Lane, G. Gettemy, K. Sincock, E. Liu, and R. Geetan*

**Angle-Dependent Ultrasonic Wave Propagation in Rocks for Estimating High-Resolution Elastic Properties of Complex Core Samples**  
*D. Olszowska, G. Gallardo-Giozza, D. Crisafulli, and C. Torres-Verdin*

**Pore Network Simulations Coupled with Innovative Wettability Anchoring Experiment to Predict Relative Permeability of a Mixed-Wet Rock**  
*M. Regaieg, F. Nono, T. F. Faisal, C. Varloteaux, and R. Rivenq*

**ElRock-Net: Assessing the Utility of Machine Learning to Initialize 3D Electric Potential Simulations**

*B. C. Chang, J. E. Santos, R. Victor, and M. Prodanović*

**Shale Characterization Using Magnetic Resonance**

*M. S. Zamiri, J. Guo, F. Marica, L. Romero-Zerón, and B. J. Balcom*

**The Effect of Nanoconfinement on the Phase Behavior of Ethane/N-Propane Binary Mixture: An Experimental Study at Varying Pore Sizes and Compositions**

*K. V. Sharma, R. M. Alloush, K. Al-Garadi, and M. Piri*

**Forced Imbibition and Uncertainty Modelling Using the Morphological Method**

*P. Arnold, M. Dragovits, S. Linden, F. Zekiri, and H. Ott*

**Initial States of Core Flooding Techniques Evaluation: A Global Pore-Scale Investigation**

*F. Nono, C. Caubit, and R. Rivenq*

**Artificial Intelligence Assisted Quantitative Petrophysical Properties Analysis using Core Images and Well Logs**

*T. Lin, M. Mezghani, C. Xu, and W. Li*

**Combining High-Resolution Core Data and Machine Learning Schemes to Develop Sustainable Core Analysis Practices**

*C. Germy, T. Lhomme, L. Perneder, and J. Cummings*

**Hybrid Technique for Setting Initial Water Saturation on Core Samples**

*V. Fernandes, C. Caubit, B. Nicot, F. Pairoys, H. Bertin, and J. Lachaud*

**Geomechanical Deformation of Saturated Porous Media under Various Wettability Conditions: A Pore-scale Investigation**

*A. Zankoor, R. Wang, M. Arshadi and M. Piri*

**A Combinational NMR and Dielectric Technique Using Spectral NMR Mapped Distributions of Dielectric Relaxation**

*J. J. Funk, M. Myers, and L. Hathon*

**Experimental Time-Lapse Visualization of Mud-Filtrate Invasion and Mudcake Deposition in Complex Rocks Using X-Ray Radiography**

*P. Aéreus, C. Torres-Verdín, and N. Espinoza*

**Causal Protocols to Assess the Viability of Native State or Restored State Preparation**

*J. Reed, S. Pruno, I. Zubizarreta, and R. Johansen*

**Carbonated Water Injection for Heavy Oil Recovery**

*J Wang, A. M. AlSofi, H. Behairy, A.M. Boqmi, and S. Caliskan*

**Simultaneous Interpretation and Uncertainty Analysis of SCAL Data from Complex Rocks**

*O. Amrollahinasab, S. Azizmohammadi, and H. Ott*

**Capturing the Wetting State of An Aged-Carbonate Core Through Pore-Scale Multiphase Flow Simulations**

*T. Wang, Y. Da Wang, C. Sun, J. E. McClure, P. Mostaghimi, and R. T. Armstrong*

**Comparison of Three-Dimensional Permeability Inversion from Positron Emission Tomography Experimental Data Using Convolutional Neural Networks and Ensemble Kalman Filter**

*Z. Huang and C. Zahasky*

**Core Characterization of Patterson #5-25 Well for Carbon Capture and Storage in Western Kansas**

*T. Paronish, R. Schmitt, D. Crandall, F. Hasiuk, E. Holubnyak, and J. Meng*

**An Approach for Image-Based Quantification of Fines Migration in Geologic Columns and Core Samples**

*C. R. Sutton and C. Zahasky*

**Investigation Pore Geometry Wettability Preference in Oolitic Oil Reservoir: Pore Scale Imaging and Modelling Study**

*H. Al-Ajaj, R. Flori, S. Alsayegh, H. AlMubarak, and W. Al-Bazzaz*

**Rapid, High Resolution Probe Screening Techniques for Core Analysis and their Potential Usefulness for Hydrocarbon or Energy Transition Applications**

*E. Okwoli and D. K. Potter*

**Applications of Temperature Dependent Paramagnetic Properties for Quantifying Mineral Content and Extending the Use of Paramagnetic Dopants for Laboratory or Borehole Analysis of NMR Data**

*C. W. Good and D. K. Potter*

**Chemostratigraphic Analysis as A Powerful Tool for the Lateral Continuity of Structurally Complex Reservoirs: A Case Study**

*A. Liborius-Parada, M. Medina-Macedo, D. Tonner, S. Hughes, and M. McCulley*

**Posters presented at the 2022 SCA Symposium**

**Carbon Capture and Storage (CCS), Evaluation of Carbon Dioxide Storage Efficiency at the Western Siberia Field**

*P. Golub, A. Cheban, and E. Romanov*

**A Joint Workflow Towards a Reliable Quantification and Understanding of NMR Surface Relaxivity**

*M. Halisch, R. Dlugosch, Z. Zhang, and A. Weller*

**Comparison of Geophysics- and Core-Based Wettability Assessment Methods: An Experimental Study Using Artificial Grain Packs**

*Z. Azizoglu and Z. Heidari*

**Multi-Scale 3D Carbonate Digital Rock Reconstruction: Traditional or Machine Learning Approaches?**

*Y. Li, X. He, M. AlSinan, H. Kwak and H.Hoteit*

**NMR T2 Response versus Roughness: A Numerical and Analytical Study**

*Y. Li, X. He, M. AlSinan, H. Kwak, and H. Hoteit*

**Nuclear Magnetic Resonance Laboratory Study of A Tight Sandstone for Robust Permeability Prediction**

*J. Gao, H. Kwak, A. Alkhaldi, and G. Hursan*

**NMR Spin-spin Relaxation in Unconventional Source Rocks**

*Z. H. Xie*

**SEM Image-Constrained Process-Based Modeling for Relative Permeability Estimation of Carbonate-Rich Mudrock**

*C. J. Landry and M. Prodanovic*

**Multi-Phase Flow in Fractured Rocks: From Pore-Scale Processes to Field-Scale Responses**

*X. He, M. AlSinan, H. Kwak, and H. Hoteit*

**Direct Measurement of In-Situ Hydrogen-Water-Quartz System Relative Permeability for Underground Hydrogen Storage in A Depleted Gas Reservoir**

*S. Higgs, Y. Da Wang, J. Ennis-King, S. J. Jackson, R.T. Armstrong, and P. Mostaghimi*

**Characterization of Surface Conductivity of Clays**

*V. Emelianov, Z. Zhang, K. Titov, M. Halisch, and A. Weller*

**Manganese-Ion Based Tailored Waterflooding Processes for Carbonates**

*A. Alghamdi, S. Salah, M. Otaibi, S. Ayirala, and A. Yousef*

**Development and Testing of A New 10000 PSI NMR Overburden Probe**

*M. Dick, D. Veselinovic, T. Kenney, and D. Green*

**A Semi-Analytical Model for Capillary Entry Pressure of Pores in Carbonates with Varying Wettability States**

*Y. Gong, B. W. McCaskill, M. Sedghi, and M. Piri*

**In-situ Characterization of Carbonate/Oil/SmartWater Interfacial Layers Using Advanced EM Techniques**

*D. Cha, M. B. AlOtaibi, S. Ayirala, A. Gmira, and A. A. Yousef*

**Study on Adsorption Behavior of a New Type Gemini Surfactant onto Quartz Surface by Molecular Dynamics Method**

*W. Lyu*

**Novel Evaluation of Oil Recovery in Rock-Like Mixed-Wet Microfluidic Systems**

*A. AlOmier, A. Sugar, D. Cha, S. Ayirala, M. AlOtaibi, A. Yousef, and H. Hoteit*