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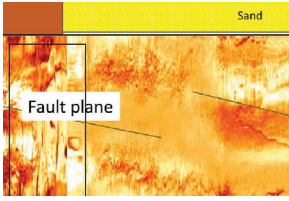
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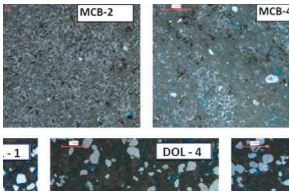
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Ahmad et al.

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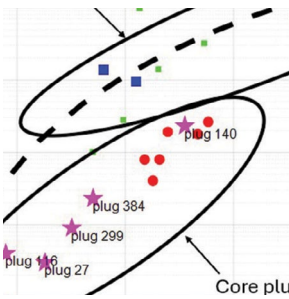
This work showcases an integration of basic to advanced log data, including three-dimensional (3D) ultradeep resistivity inversions, to enhance the geometrical understanding of sand-injectite reservoirs. Furthermore, 3D ultradeep resistivity inversions are employed in reservoir framework modeling, which could significantly aid in sectorized reservoir modeling and future well placement strategies.



Al-Hamad et al.

PAGES 106–122

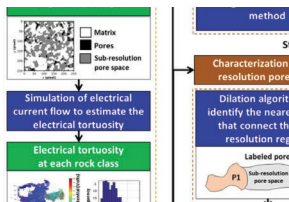
Understanding the effect of CO₂ on carbonate integrity is essential for successful CO₂ storage and sequestration. In this study, we investigated the effect of the CO₂ solubility trapping mechanism on carbonate rock samples. The results revealed that all samples exhibited changes in petrophysical properties post-CO₂ aging; however, the stiffness of the core samples was only slightly affected by the exposure during static aging.



Al Mershed et al.

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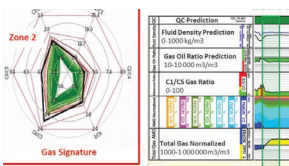
The paper addresses how solid bitumen in a carbonate reservoir in Kuwait occludes primary porosity and reduces permeability. It introduces a petrophysical model that uses calibrated nuclear magnetic resonance (NMR) workflows to quantify in-situ bitumen and assess its impact on reservoir productivity. Laboratory NMR measurements at different frequencies and temperatures reveal that conventional “deficit porosity” methods may underestimate bitumen volume, as short T_2 components linked to solid-like organic matter are often missed. Finally, a permeability model shows that pore-filling bitumen can reduce permeability by one to two orders of magnitude compared to bitumen-free zones.



Arrieta et al.

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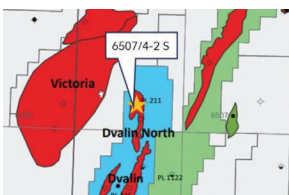
This paper introduces a multiscale workflow for depth-by-depth permeability assessment by integrating nuclear magnetic resonance (NMR) and mercury injection capillary pressure (MICP) data with hydraulic tortuosity estimates from micro-CT images. Application to the Barra Velha Formation in the Brazilian presalt showed that this hydraulic-based approach improved permeability assessment by 61% compared to those obtained using electrical tortuosity.



Bravo et al.

PAGES 68–80

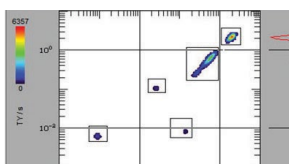
This paper presents an integrated workflow combining advanced mud gas analysis, petrophysical logs, and selective fluid sampling, demonstrated through Norwegian field cases to reduce uncertainty, resolve ambiguous log responses, validate fluid contacts, and improve understanding of hydrocarbon distribution and flowing phases in complex and depleted reservoirs.



Datir et al.

PAGES 81–91

This paper shows how advanced logging services and multiphysics inversion-based parameterization can be leveraged to reduce uncertainty in complex reservoirs. By integrating various petrophysical measurements, the workflow delivers more reliable water saturation estimates, reducing S_w uncertainty from ~8% to ~1% and enabling clearer hydrocarbon differentiation and improved reservoir value.

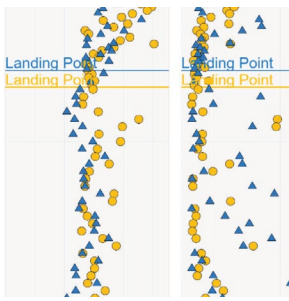


Gao et al.

PAGES 38–53

This paper introduces a discrete inversion approach for interpreting nuclear magnetic resonance (NMR) relaxation data to improve fluid typing and quantification. Results on synthetic and laboratory data show the method can provide stable, practical outputs and can be used either on its own or alongside conventional inversion workflows.

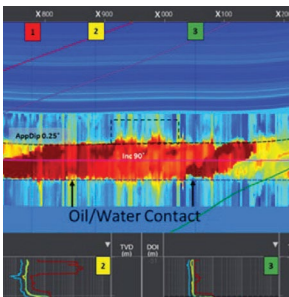
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Kriscautzky et al.

PAGES 9–26

This paper presents a standardized, calibrated drill-cuttings-based reservoir characterization workflow that integrates high-resolution imaging, artificial intelligence (AI)-driven image analysis, and X-ray fluorescence (XRF) elemental data to evaluate two horizontal wells in the Vaca Muerta Formation, Neuquén Basin, Argentina. The approach identifies lithotypes, lithological domains, and laterally varying sedimentary packages, including tuffaceous, siliciclastic, and calcareous intervals, and relates these variations to depositional conditions and geosteering response. The results demonstrate that AI-enhanced cuttings analysis provides a cost-effective, reproducible approach for high-resolution reservoir characterization and improved well planning.

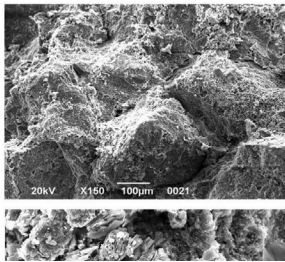


Ma et al.

PAGES 220–238

Traditional workflows for horizontal well placement rely on electromagnetic (EM) look-around technologies to identify resistivity boundaries and track geological features near the bottomhole assembly (BHA). But what happens when unexpected discontinuities, such as faults, erosion surfaces, or depositional discontinuities, lie ahead? To address this challenge, a new paper introduces a three-dimensional (3D) EM look-ahead inversion workflow, validated on synthetic data and a real-world case involving faulting in a horizontal well. Results demonstrate successful detection of resistivity changes ahead of the bit, enabling improved decision making in complex subsurface environments.

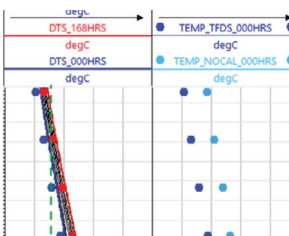
Rock type 1b (a)



Musu et al.

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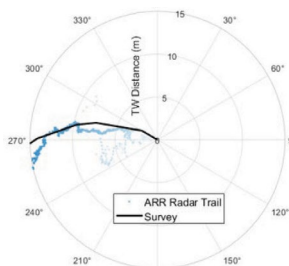
This study presents a new type curve for rock typing in heterogeneous sandstone reservoirs based on a pore geometry-structure (PGS) approach that links microscopic geological characteristics with pore system architecture. Analysis of 1,342 core plugs from 21 sandstone reservoirs demonstrates systematic relationships between pore geometry and pore structure, forming the basis of a physically meaningful type curve. The PGS-based approach provides a consistent rock typing framework grounded in both geological and engineering principles and serves as an important tool for permeability prediction and for improving saturation modeling in both static and dynamic reservoir models.



Pirrone and Mantegazza

PAGES 27–37

This paper presents an innovative modeling of continuous fiber-optic measurements, improving the dynamic characterization of injection wells in the early stages of carbon capture and storage projects. The approach uses physics-based methodologies to obtain fluid mapping from distributed temperature sensing and provides a comprehensive description of well thermal performance. This is essential for understanding and optimizing the injection of carbon dioxide through calibrated thermo-fluid dynamic simulation models.

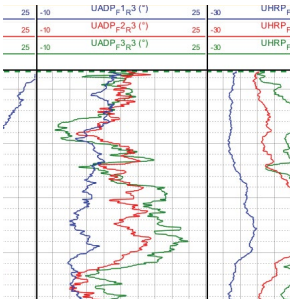


Salim et al.

PAGES 207–219

This paper describes two distinct field examples related to the active resistivity ranging (ARR) while-drilling application for near-parallel well scenarios. It consists of an innovative ranging solution deployed using downhole electromagnetic measurements from an ultradeep azimuthal resistivity (UDAR) tool. ARR can be utilized in different ranging applications, such as well twinning, borehole interception, and collision avoidance, consequently increasing safety in drilling operations and enabling well construction toward zones not permitted today due to well collision risks.

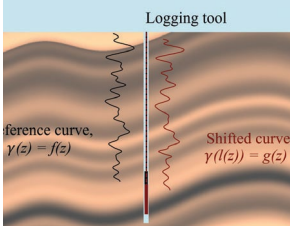
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Saputra et al.

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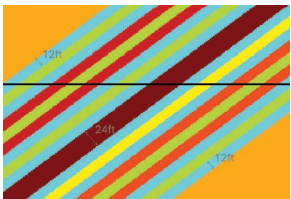
The authors present recent advances in forward modeling and data-adaptive multidimensional inversion of borehole ultradeep azimuthal resistivity (UDAR) measurements, using a new forward solver that is more accurate and stable, converges faster, and computes the Jacobian required for inversion more efficiently than the traditional Lanczos Spectral Decomposition Method. The data- and model-adaptive multidimensional inversion method is verified using challenging synthetic models and field measurements, showing progressive reductions in data misfit and model uncertainty as model dimensionality increases. Computational cost is also reduced by triggering expensive two-dimensional (2D) and three-dimensional (3D) inversions only when necessary.



Westeng et al.

PAGES 54–67

This paper introduces a continuous optimization framework for dynamic depth alignment of well logs that maximizes inter-log correlation while constraining shift magnitude and smoothness through physically motivated regularization terms. Although the method requires tuning of weighting parameters, these parameters are robust across wells and curve types, eliminating the need for well-by-well or curve-pair-specific calibration and enabling robust, explainable automation of log alignment.



Wu et al.

PAGES 161–172

This paper proposes an integrated electromagnetic inversion approach that improves measurement consistency and subsurface characterization across multiple spacings and frequencies. The methodology enhances inversion stability and resolution, leading to more robust geological interpretation. Synthetic and field examples demonstrate the effectiveness of the proposed approach.