

SPWLA HOUSTON

Advancing The Science
Of Formation Evaluation

2025 Q1 Technical Talks / Luncheon Meetings

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What is Rdeep (Deep Resistivity)?

By: Dr. Michael Rabinovich (bp)

Westside

SLB - 6350 West Sam
Houston Parkway North
Houston, TX 77041

Petrophysicist Bootcamp: Maximizing Insights and Potential

By: Yuan C. Cong

Modeling and Correcting the Impact of the Rate of Penetration on LWD NMR Measurements: Addressing Over-Polarization and Motion Induced Decay Effects

By: Zeyad Ramadan (SLB)

Downtown

Virtual / webinar

From Leak Path Detection to Quantitative Flow Profiling: The Exciting Journey of the Noise.

Giuseppe Galli – Eni S.p.A.

Chevron building
1400 Louisiana St
Houston, TX - 77002

Influence of Salt Concentration and Type on Dielectric Permittivity of Rocks

By: Zulkuf Azizoglu – University of Texas at Austin

February 5, 2025

Dear Members of the SPWLA Houston Chapter

The past year turned out quite dynamic for the chapter: early spring, we welcomed a refreshed Executive Board with several new faces (yours truly one of them), following elections with a great turn-out. Only few months into our “reign”, the Board saw 2 changes to its membership and we hope that we will finish our ride with no more changes.

We hosted many technical presentations / luncheon meetings with great speakers discussing a wide variety of topics of interest to the Houston petrophysical community, evidenced by great attendance – we had one “sold out” event – and animated discussions following the formal presentations.

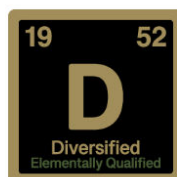
The monthly networking events at Cedar Creek Bar & Grill too were all well attended and a great opportunity for informal discussion of (petrophysical) issues on our minds, the state of the industry, science, football (soccer too), travel, family and friends.

Sadly, we were unable to organize the Annual Houston Technology Show in 2024 as we were unable to attract sufficient sponsors and vendors willing to commit to the show. A reflection of the state of the industry? We will double down on our efforts to bring the Technology show back in 2025.

We constantly strive at improving and take feedback from our members seriously. Don’t be shy, we welcome your feedback, ideas and suggestions and are also ready to schedule your (technical) presentation for an upcoming luncheon meeting.

Ron J.M. Bonnie
Houston Chapter President.

Sponsors and Friends of the Houston Chapter



Thursday, Jan 16th, 2025
11:30 am – 1:00 pm

SLB - 6350 West Sam
Houston Parkway North
Houston, TX 77041

Westside Technical Talk / Luncheon Meeting

Petrophysicist Bootcamp: Maximizing Insights and Potential

By: Yuan C. Cong

Abstract

In the AI/ML era, mastering the training of models is crucial for long-term success and optimal results. Above all, the quality of the data is the paramount, along with understanding the nature of each data category, whether quantitative or qualitative, and the analysis approach, whether probabilistic or deterministic. Petrophysicists must possess this knowledge to correctly and effectively instruct AI/ML models. This one hour webinar is a concentration of a daily course which delves into the essential theories of logging equipment and quality control in data acquisition and also explore software-independent readout, quick-look analysis techniques for swift decision-making on site. This webinar will focus on essential concepts, Key points, and area of concerns instead of covering in-depth details

Biography

With over 35 years of experience in wireline logging and LWD with major service providers, this career has consistently been on the frontline, spanning hands-on operations, global technical support, and data analysis/interpretation. This includes overseeing critical logging jobs 24/7 from both operational and geoscience perspectives. Experience includes serving a range of IOCs, NOCs, and independent oil and gas companies worldwide. The work has covered everything from single well operations to comprehensive field studies, encompassing exploration logging program planning, implementation, analysis, interpretation, completion evaluation, and production/injection well profile and integrity monitoring.



Wednesday, Jan 29th, 2025
11:30 am – 1:00 pm

Virtual
On-line only

Downtown Technical Talk

From Leak Path Detection to Quantitative Flow Profiling: The Exciting Journey of the Noise.

By: Giuseppe Galli (Eni S.p.A.)

Abstract

Downhole well surveillance is considered, during an asset exploitation, a mainstay for the proper characterization of well completions and reservoir behavior. For these activities, specific tools have been developed to address wellbore integrity issues (e.g., sonic, ultrasonic, electromagnetic logs) and to depict downhole dynamics in injectors/producers (i.e., production logging). However, these standard techniques may have some limitations. For instance, cement logs provide an indirect static picture of the cement placement scenario and are not able to highlight fluid movement behind tubulars if present. On the other hand, production logging can only capture fluid flow inside the completion. Therefore, it is not possible to know the flow path from the reservoir towards the well, together with the active reservoir units. Advanced Noise Logging (ANL, operating in a wide frequency range) can be an elegant solution to overcome these limitations. This paper first shows how ANL is the key to addressing tricky wellbore and completion integrity issues and then introduces a novel methodology for the quantitative use of ANL by means of an in-house spectral analysis of the recorded data. The versatility of ANL makes it suitable for multiple uses, and this is demonstrated here by several selected case histories involving different commercial tools. In detail, the measured signal (associated with particular fluid flow paths) is modeled to extract noise power amplitudes in specific frequency ranges and qualify fluid movements through the reservoir, cement channels/microannuli, pipes, and other completion elements (such as leaking valves and packers). For what concerns the presented wellbore integrity applications, the enhanced spectral analysis has provided a detailed noise classification and allowed a robust identification of the issue preparatory to possible remediation actions. Further, from a quantitative standpoint, modeling of ANL data in injection/production wells has been implemented to assess the relative flow rate in the borehole, the relative flow rate in the reservoir, and actual net pay. The latter are unique outcomes from ANL that are fundamental in challenging environments where standard production logging interpretations are not consistent or not exhaustive: the presence of asphaltenes, waxes and/or solids in the borehole, highly heterogeneous reservoirs, stimulated scenarios, and complex completions. It is worth mentioning that the reliability of such ANL-based dynamic characterization has been validated in standard scenarios with conventional production logging results (for more than 20 surveys). The novelty of the approach relies on the key role played by the enhanced modeling of ANL data and the demonstrated versatility of the measurement, with applications spanning from unusual poor cement placement issues to completion microleaks. Moreover, the quantitative use of noise power amplitudes in selected frequency ranges is relatively new and puts ANL in a prime location for the dynamic characterization of very complex scenarios when the fluid flow path behavior near the wellbore is nontrivial. Finally, the outcomes of the extensive ANL analysis represent a strategic input for production optimization activities, remedial jobs, workovers, well test interpretations, permeability estimations, and 3D dynamic reservoir modeling.

Biography

Giuseppe Galli is currently Petroleum Engineering & Operations Senior Advisor in Eni with more than 30 years of oil industry experience in open-hole and cased-hole well logging, production logging, fiber optics, tracers and reservoir monitoring. He is involved in activities of reservoir management, production optimization and rejuvenation of mature fields. Giuseppe is author of many technical papers and posters. Graduated in Geology in 1990 at the University of Parma, he joined Eni in 1991 as Well Site Geologist.

Ali Eghbali Giuseppe Galli SPWLA Webinar

Wellbore Integrity and Dynamic Characterization

Leak Detection

Borehole/Reservoir Dynamic Characterization

SPWLA-2024-0106 2024-25 SPWLA Distinguished Speaker Series

Thursday, Feb 6th, 2025 12:00 am – 1:00 pm	Chevron building 1400 Louisiana St Houston, TX - 77002	Downtown Technical Talk / Luncheon Meeting
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Influence of Salt Concentration and Type on Dielectric Permittivity of Rocks.

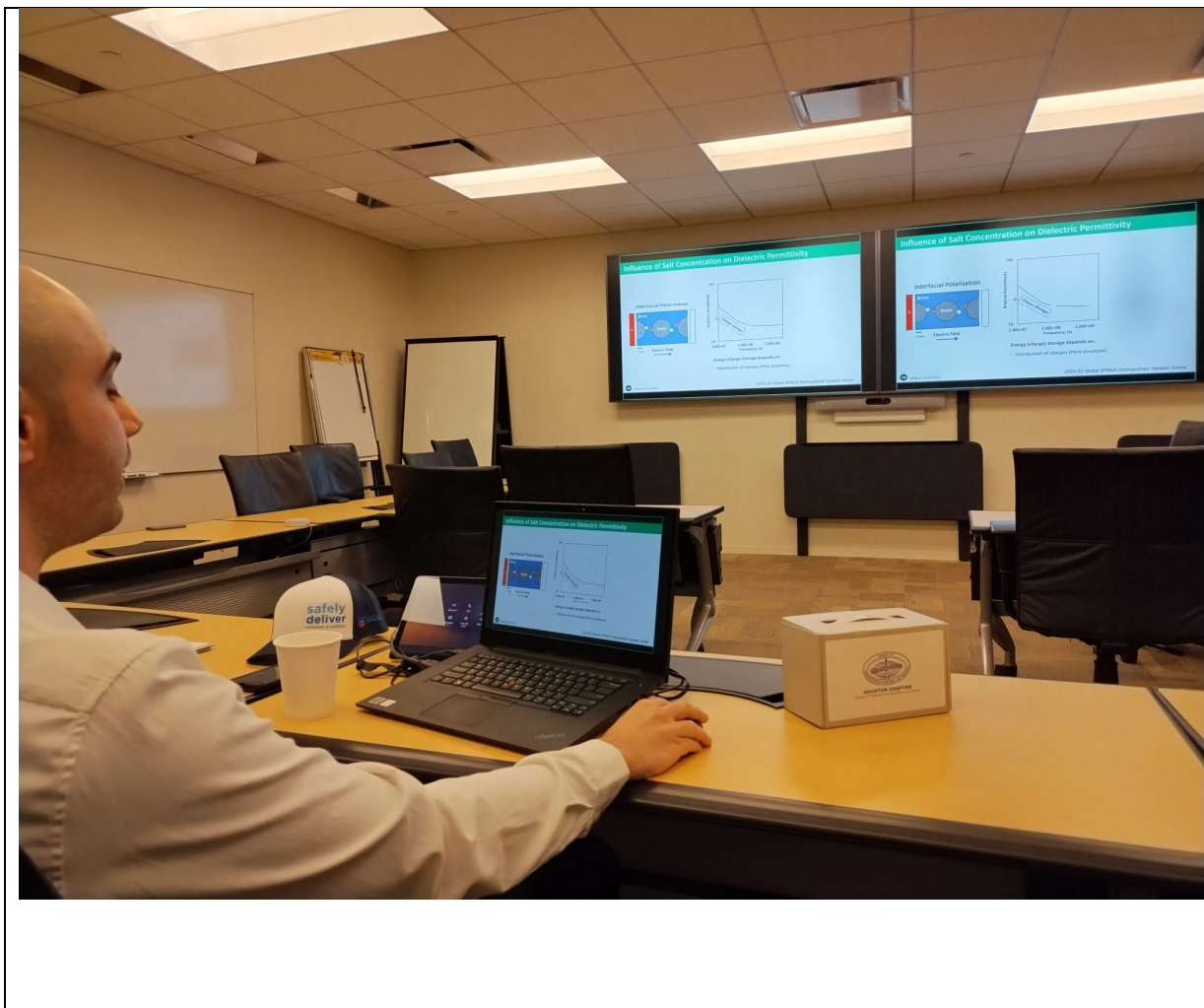
By: Zulkuf Azizoglu (University of Texas at Austin)

Abstract

Ionic properties and concentration significantly influence the response of brine-saturated rock samples to electromagnetic disturbance. However, the dielectric permittivity response of rock samples under different ionic conditions is poorly described. This significantly limits the potential information that could be gained from dielectric permittivity measurements about the pore geometry and fluid content. Therefore, the influence of salt concentration and type on broadband dielectric permittivity must be quantified in the pore- and core-scale domains to develop analytical dielectric permittivity models. The objectives of this paper are to (a) investigate the influence of salt type and concentration on dielectric permittivity via experimental measurements and pore-scale simulations and (b) identify the limitations of current effective medium theories in the interpretation of dielectric permittivity measurements in samples with different ionic conditions. We investigate the influence of salt concentration and type on the dielectric permittivity of pore- and core-scale Berea sandstone samples. First, we perform frequency-domain dielectric permittivity simulations to quantify the response of the porescale models to electric field excitation. The frequency-domain dielectric permittivity simulator solves Maxwell's equations under quasi-static conditions at discrete frequencies. We simulate the dielectric permittivity in the frequency range of 20 MHz to 3 GHz. We run the simulations in samples saturated with NaCl, KCl, and MgCl₂ brines. The salt concentration of the brine solutions ranges between 2 to 100 PPT. For the core-scale analysis, we fully saturate the samples with different brine solutions at varying salt concentrations. In the core-scale domain, we use the exact brine solutions and salt concentrations defined for the pore-scale analysis. The dielectric permittivity measurements were conducted using a network analyzer with a hightemperature coaxial probe setup in the frequency range of 200 MHz to 3 GHz. We observed that relative permittivity at 1 GHz decreases with increasing salt concentration, irrespective of the brine type. However, the type of salt significantly controls the magnitude of the decrease in relative permittivity. After increasing the salt concentration from 10,000 to 100,000 PPM, relative permittivity at 1 GHz decreased by 7% and 11% when the samples were saturated with KCl and NaCl brine solutions, respectively. Furthermore, this behavior was enhanced as the frequency decreased. The impact of salt type on relative permittivity was negligible in samples saturated with 10,000 PPM brine solutions. Finally, we examined the potential errors that could arise from assuming an inaccurate salt type in the interpretation of dielectric permittivity measurements. We observed that incorrect assumptions about the brine type could result in up to 20% relative errors in water saturation assessment via dielectric permittivity measurements. Therefore, taking the influence of salt concentration and type into account is critical for a reliable interpretation of dielectric permittivity. The outcomes of this work will be helpful in the interpretation of dielectric permittivity measurements in formations with variable salt concentrations of formation water. Additionally, in the cases where the salinity of the formation water is unreliable, this work will illuminate the extent to which the dielectric permittivity measurements can be used for petrophysical analysis.

Biography

Zulkuf Azizoglu is a Ph.D. candidate in the Hildebrand Department of Petroleum and Geosystems Engineering at The University of Texas at Austin. He holds a B.Sc. in Petroleum Engineering from Middle East Technical University. He is currently a graduate research assistant at The University of Texas at Austin under the supervision of Dr. Zoya Heidari. His research interests include the interpretation of electrical measurements for petrophysical evaluation. He loves physics and philosophy.



SPWLA – Houston Chapter News Q1 2025

<p>Thursday, Feb 13th, 2025 11:30 am – 1:00 pm</p>	<p>SLB - 6350 West Sam Houston Parkway North Houston, TX 77041</p>	<p>Westside Technical Talk / Luncheon Meeting</p>
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Modeling and Correcting the Impact of the Rate of Penetration on LWD NMR Measurements: Addressing Over-Polarization and Motion Induced Decay Effects

By: Zeyad Ramadan

Abstract

The effect of axial motion, particularly the rate of penetration (ROP), on Logging While Drilling (LWD) Nuclear Magnetic Resonance (NMR) measurements poses significant challenges in ensuring measurement accuracy during well logging. This is because the physics of a moving NMR tool differs from that of a stationary one. At high logging speeds, NMR tools experience over-polarization and motion-induced decay when logging formations with slow longitudinal and transverse relaxation times (T_1 & T_2). However, since the physics and mathematics of these effects are well understood, the impact of logging speed can be modeled and corrected. This talk will explore the underlying physics of the ROP effect and how it can be accurately modeled and compensated for to improve measurement reliability.

Biography

Zeyad J. Ramadan is a Principal Petrophysicist at the SLB Houston Formation Evaluation Center. He has held various roles in borehole geology, well placement, petrophysics, and answer product development across several countries, including

Libya, Qatar, Egypt, France, Kuwait, and the USA. He earned his MSc in Earth Science from Benghazi University in 2008. Zeyad's current work focuses on petrophysical answer product development.



Networking Events

SPWLA Houston Chapter Networking Event

Location: Cedar Creek Bar & Grill, 1034 West 20th Street, 77008

The SPWLA Houston Chapter invites the entire community to join us for an exciting networking event! There's no need to RSVP—just come as you are and enjoy an evening of casual networking with fellow petrophysics enthusiasts.

Our social gatherings attract professionals from various fields, including Petrophysics, Geology, Geophysics, Engineering, and Management. You'll also have the chance to mingle with current and past SPWLA international board members and recognized industry leaders.

This event will be partly outdoors, so please dress accordingly.

SPWLA Houston is committed to hosting engaging and enjoyable activities for our members. If you're interested in sponsorship opportunities, feel free to reach out.

We look forward to seeing you there!



Saturday, Feb 1st, 2025
8:00 am – 1:00 pm

University of Houston

SPWLA Student Paper Contest

Several SPWLA Houston-Chapter board members were privileged to judge the 2025 SPWLA Student Paper Contest held at the University of Houston. Six students presented their research, covering topics such as estimating mechanical properties of carbonate-rich mud rocks, multi-physics characterization of multi-pore systems in carbonates, variable matrix-density estimation in shaly sandstones, assessing sand production risks, the impact of CO₂-brine interactions on rock properties, and salt creep assessment for underground storage applications.

While all presentations demonstrated novelty and hard work, the judges selected the top three students to advance to the regional competition. Congratulations and best of luck to Tariq Saihood, Franklyn Angel-Saez, and Muhammad Noman-Khan as they move on to the next phase





Future Events and Details

Thursday, Feb 27th, 2025 11:30 am – 1:00 pm	Baker Hughes 2001 Rankin Rd Houston, TX 77073	Northside Technical Talk / Luncheon Meeting
What is Rdeep (Deep Resistivity)? <i>By: Dr. Michael Rabinovich (bp)</i>		
Abstract Rdeep (Deep Resistivity) is an outdated concept that has been relevant for focused wireline measurements when invasion is the main environmental effect to worry about. Unfortunately, this concept is still very much in use in operating companies when petrophysicists select just one resistivity curve to use in their petrophysical workflows and water saturation calculations. Currently, Rdeep usually means the apparent resistivity curve which is the least affected by environmental effects and closest to R_t , but selecting Rdeep could be tricky especially from unfocused LWD resistivity curves because: a. different environmental effects affect different curves differently; b. several environmental effects may affect simultaneously; c. in the same well different curves should be selected as Rdeep in different sections. The best way to understand environmental effects and correct for them or/and select Rdeep if absolutely necessary is to use resistivity modeling and inversion. Ultimately, we recommend using R_t instead of Rdeep.		
Biography Michael Rabinovich is a Principal Subject Matter Expert in Resistivity Logging and Geosteering at bp Central team. Before joining bp in 2012, he was with Baker Hughes for 18 years as a scientist, Sr. Manager of Computational Physics group, and later as Deputy Director of Research of Drilling and Evaluation. He received his Msc degree in 1983 from the Moscow Institute of Oil and Gas industry and his PhD degree in 1989 from the Russian Academy of Science, both in Geophysics. He is an author/coauthor of more than 100 publications and 44 patents.		

Thursday, March 27th, 2025 11:30 am – 1:00 pm	Baker Hughes 2001 Rankin Rd Houston, TX 77073	Northside Technical Talk / Luncheon Meeting
Navigating the Energy Transition: The Evolving Role of Petrophysicists and Opportunities for Growth <i>By: Dr. Salazar</i>		
Abstract The energy transition is a pressing topic, inspiring both optimism and concern. Key questions arise: Will renewable energy fully replace fossil fuels? What role will hydrocarbon's exploration and production professionals play in the decades ahead? According to the International Energy Agency, by 2050, approximately 50% of the world's energy consumption will still rely on fossil fuels. This highlights the crucial role petroleum engineers and geoscientists will continue to play in building a sustainable, energy-efficient economy. Petroleum Engineers, particularly formation evaluation specialists are uniquely positioned to drive the exploration of new energy resources and foster the development of cleaner technologies, while also remaining leaders in the responsible exploitation of fossil fuels. In this presentation, I will discuss the evolving role of petrophysicists in both the current oil and gas industry and the future energy landscape, sharing insights from my own career journey. Additionally, I will provide strategies for refining both technical and soft skills, helping to build a resilient, long-lasting professional career.		
Biography esús M. Salazar earned his Ph.D. and M.Sc. in Petroleum Engineering from the University of Texas at Austin and his B.Sc. in Physics (with honors) from the Central University of Venezuela. In 2024, Salazar re-joined ConocoPhillips upon the acquisition of Marathon Oil in Houston where he works as a Petrophysicist for the Gulf Coast and Rockies Region, following various roles with Marathon Oil, ConocoPhillips, Occidental, and PDVSA across the U.S., Canada, Australia, and Venezuela, working in various technology, exploration, and operations positions for over 25 years.. He served as President and VP of Technology for the Society of Petrophysicists and Well Log Analysts (SPWLA), Executive Editor of the peer-reviewed <i>SPE Reservoir Evaluation and Engineering</i> journal, and Associate Editor of <i>Petrophysics</i> . Jesús is currently Associate Editor for		

the *SPE Journal* and was recognized with the SPE Peer Apart Award in 2020 and selected one of SPE's Distinguished Lecturer for the 2022–2023 season. Dr. Salazar has published numerous papers in peer-reviewed journals and conferences, winning the Best Paper Award in *Petrophysics* in 2006. An avid traveler who has visited over 40 countries, Jesús enjoys running, hiking, watching movies, TV series, and MLB Baseball, and, above all, sharing these experiences with his wife and two children..