

Tuesday, January 17, 2017

Southwestern Energy Conference Center, 10000 Energy Drive, Spring, TX 77389
Social 11:15 a.m., Luncheon 11:30 a.m.

Cost: Active/Associate Members - \$30, Emeritus/Life/Honorary - \$25

Students who are members of HGS - \$10, Non-members - \$40

To guarantee a seat, pre-register on the HGS website & pre-pay by credit card.

Pre-registration without payment will not be accepted.

Walk-ups may pay at the door if extra seats are available.

If you are an Active or Associate Member who is unemployed and would like to attend this meeting, please call the HGS office for a discounted registration cost. We are also seeking members to volunteer at the registration desk for this and other events.

HGS Northsiders Luncheon Meeting

Sweta Bose and Scott Jacobsen
Southwestern Energy

HGS Northsiders Luncheon Meeting

Case Study: Application of Multicomponent Induction Tool Inversion to Natural Fracture Characterization in a Resource Play

Naturally occurring fractures often play a very critical role in defining a shale play, and fracture identification, typically from image logs, has become a key component in a range of situations from efficient drilling design to reservoir development. In this vein, to complement the usage of image logs in fracture detection work, recent applications of multi-component (or triaxial) induction log data were investigated in a four-well US resource play case study.

The multi-component induction tool data were acquired in all four vertical wells in the study. All of these were drilled with oil-based mud systems. Additionally, electrical and acoustic imaging logs were run in three of the wells to compare the fracture indications between the various tools. Whole core was also available to provide visual physical evidence of fracture existence and features.

Inversion of multi-component induction data normally yields bedding dip magnitudes and azimuths. An extension of this inversion technique provides a qualitative indicator of high-angle fracture presence and intensity from the same data. These fracture planes do not have to intersect the borehole, but can be several feet away and still be detected.

The focus of this work was to benchmark induction tool-based fracture characterization in oil-based mud against both slabbled core and traditional wellbore imaging log interpretation. In one of the wells where operational problems precluded image log acquisition, only the induction data were available. In this case,

we found an important correlation between the induction log fracture derivation and drilling events and data.

We assert that this new process promises to be an important tool for the recognition and characterization of natural fractures, especially in conditions where pad-contact image logging tools are sensitive to washouts, rugose borehole, deviated wellbores and other adverse borehole conditions, and especially in heavy oil-based mud where acoustic and electrical data quality is often compromised. ■

SPWLA publication, reference SPWLA-2016-1537

Biographical Sketches

SWETA BOSE was a Senior Petrophysicist with Southwestern Energy in Houston. Prior to that, she worked for ExxonMobil Company in Houston and Schlumberger DCS Denver as a Senior Petrophysicist and Borehole Geologist respectively. She has a PhD in Environmental Sciences (Inorganic Geochemistry) from Wright State University, USA and a MS in Geology from University of Calcutta, India. She is a member of SPWLA.

SCOTT JACOBSEN is a Sr. Staff Petrophysicist with Southwestern Energy in Houston. Prior to that, he worked for Schlumberger for 35 years in various log interpretation development areas and retired in 2010 as a Petrophysical Advisor. He has a BS in Electronics Technology from Northern Illinois University and a BS in Electrical Engineering from the University of Notre Dame. He is a member of SPWLA.