

HFTS I & II - Observations on Fracture Geometry and Proppant Distribution

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Dr. Debotyam Maity is a Senior Engineer in the Sub-Surface Technology Group at the Gas Technology Institute (GTI). His presentation will be at 9:00 Central Time on Thursday, November 17, 2022. The topic is “*HFTS I & II - Observations on Fracture Geometry and Proppant Distribution.*”

Abstract

The HFTS program involves multiple high data density hydraulic fracturing research sites across the Wolfcamp and Eagleford shale formations in Texas. The fundamental differentiator is that these sites are part of the regular development plans for various operators and hence, provide a unique opportunity to understand fracturing behavior in the subsurface under field conditions but with required research controls. This presentation will delve into results from a more fundamental aspect of the HFTS research effort which involved understanding the far-field fracture system as well as proppant distribution at these sites.

Results show that fracture characteristics are governed by spatio-temporal fracture propagation effects. In addition, varying rock properties play a significant role since they impact fracture face morphology as well as second order stress effects. We highlight results from new proppant logging technique (ProppantLog) at both the core scale as well as well scale at in-fill locations. Observations suggest that proppant entrapment is a function of fracture morphology or complexity, i.e., surface characteristics are key to observing entrained proppant in significant amounts. However, more importantly, observed proppant should not be interpreted as is, and needs to be qualified with other derived parameters from proppant log observations, such as relative abundance of smaller particles.

We introduce the interpretation framework for primary and secondary fractures and associated corridors which significantly impact well productivity. Our tests have shown that if carefully used, ProppantLog properties can provide key insights into

propped vs. unpropped zones as well as presence of significant propped fracture corridors and help validate FDI's and related productivity impacts that are typically observed post fracturing.

Biography

Debotyam Maity is a Senior Engineer in the Sub-Surface Technology Group at Gas Technology Institute (GTI). He has worked with GTI for the past 8 years. His research interests revolve around data analytics, reservoir characterization, geophysical techniques, geomechanics, hydraulic fracture completions as well as fracture diagnostics. He has been involved with various DOE funded research projects in the hydraulic fracturing as well as geothermal space. He has authored more than 30 technical papers and holds three patents in the field of hydraulic fracturing completion techniques and diagnostics. Dr. Maity holds a Ph.D. in Petroleum Engineering from University of Southern California and is a member of SPE.