

Hydraulic Fracture Monitoring: The State of the Art in Distributed Fiber Optic Strain Sensing

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Dr. Kan Wu is an Associate Professor and Class of '75 DVG Career Development Professor in the Harold Vance Department of Petroleum Engineering at Texas A&M University. She will speak on Thursday, February 22, 2024. The topic is *“Hydraulic Fracture Monitoring: The State of the Art in Distributed Fiber Optic Strain Sensing.”*

Abstract

Downhole monitoring of strain through Distributed Fiber Optic Sensing (DFOS) technology provides unique insights into the propagation and geometry of hydraulic fractures across adjacent wells during stimulation. This presentation aims to offer a comprehensive overview of the latest advancements in this field, emphasizing the fundamental principles that underlie the measurements of strain response during stimulation. It will include case studies that demonstrate the application of strain measurement in fracturing, as recorded from both vertical and horizontal monitoring wells. The discussion will cover the analysis of cross-well strain measurements from horizontal monitoring wells, with the goal of assessing the impact of various completion designs on the geometry of hydraulic fractures and determining an optimal completion design. Additionally, the presentation will address the influence of mechanical slippage on field measurements to improve data interpretation. Finally, it will discuss the determination of fracture height through vertical strain obtained from vertical monitoring wells and present a field case study.

Biography

Kan Wu is an associate Professor and Class of '75 DVG Career Development Professor in Harold Vance department of petroleum engineering at Texas

A&M University. Dr. Wu is the director and founder of the Advanced Geomechanics Fracture & Reservoir Application Consortium (AGFRAC). Her research interests include data interpretation and forward modeling of Distributed Fiber Optic Strain Sensing, hydraulic fracture modeling, monitoring, and optimization, subsurface monitoring of Carbon storage and Enhanced Geothermal Systems, and Hybrid physics and data-driven modeling. Wu has authored or co-authored 120 technical papers, which have been cited more than 5000 times (Source: Google Scholar). Kan holds a Ph.D. degree in petroleum engineering from The University of Texas at Austin. She was selected as a SPE Distinguished Lecturer of 2023-2024.