

## **Regional Fine-Scale Sequence Stratigraphy of the Woodford Shale and Its Impacts on Microseismic Activity and Optimizing Future Hydraulic Fractures**

**Jing Zhang, J. Scott, and Roger Slatt**

University of Oklahoma

### **Abstract**

Microseismic study has been playing an important role in widening our view to explore unconventional reservoirs, characterize fracture networks, brittle ductile couplets, and well space scale heterogeneities. This study is focused on comparing the relationship between microseismic interpretation results from brittle ductile couplets identified from cuttings and stratigraphic framework. Interpretation of seismic alone could lead to a huge bias especially in unconventional reservoirs that are affected by high potential VTI and HTI (vertical and horizontal transverse isotropy). Correlation between microseismic and geologic data of the reservoir could strengthen the interpretation of results and filter out the pseudo-events displayed within the microseismic data.

The cuttings obtained from the microseismic treatment well and nearby well can be a good indicator of lithology change and geomechanical properties at certain depths. With fluctuations a horizontal well trace in the target window, the cuttings correspond with alternations of brittle and ductile couplets indicated by well log trends. Considering the microseismic event distribution, which mirrors the induced fracture network around the well bore, the identification of brittle and ductile zones improves.

The results of interpretation helps to locate the desirable zone with brittle properties and determines the future horizontal well drilling and fracturing scenario in the Woodford Shale.