

**ORAL PRESENTATIONS ABSTRACTS
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**Wolfcamp Formation Reservoir
Characterization Using Digital Rock
Physics**

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Introduction

The Wolfcamp Formation has emerged as a major unconventional resource play in Texas. There is a wide range of oil vs. water production observed in the hundreds of horizontal wells that have targeted this formation. This variability has become a serious challenge and leads to increased risk for many operators and there is a strong need to understand the cause. Using slabbed core from the Texas Bureau of Economic Geology (BEG) in Austin, TX, we have applied the tools of Digital Rock Physics to look for some clues. The well will be referred to as Wolfcamp-1 and is located in the southern Midland Basin.

The 168ft cored interval from Wolfcamp-1 was X-ray CT imaged using a dual-energy method. This data was used to select the exact locations where plug samples were needed to begin to understand the rock characteristics. Additional detailed analysis was conducted on these plug samples to define and quantify the key shale reservoir Permeability in this figure was computed in the horizontal plane using FIB-SEM digital rock volumes.

Summary

The collection and integration of the data from this Digital Rock Physics (DRP) study of samples from the Wolfcamp formation shows that rock types, porosity, and permeability are highly variable and that data from the Wolfcamp-1 well are typical of other Wolfcamp samples we have tested. The DRP analysis further shows that some samples have mostly intergranular pores and while other samples have mostly porosity inside the or-



ganic material. Both types of samples may have relatively high porosity and permeability. If we assume that water resides mostly in the intergranular pores and that hydrocarbons are more common in the organic pores, then it suggests water cut may be reduced by targeting the completion in the intervals with greatest organic porosity.

