LSU Team to Improve Models for Deepwater Well Flow Rate Prediction

A team of LSU professors, led by Christopher D. White, associate professor of the Department of Petroleum Engineering and the Center for Computation & Technology (CCT), is researching ways to improve modeling capabilities to better characterize, predict, and analyze pressure and rate behavior in deepwater wells.

The researchers were awarded a grant from Shell over the course of three years for the project, "High-Rate Flow in Gravel Packed Wells: Completion Characterization and Pressure Transient Behavior."

"Characterization, prediction, and analysis of pressure and rate behavior in deeper wells presents many challenges," said White. "Flow geometry in completions may be complex, especially for gravel-packed wells; flow may be non-Darcy; and layering, skins, and boundaries may interact such that pressure-rate transients are difficult to interpret consistently."

"The goal of the research is to improve modeling capabilities by characterizing samples of reservoirs and completion materials by x-ray tomography, conventional core analysis, and capillary pressure measurements; and lab measurements of permeability and inertial parameters. Flow modeling will assess the impact of completion and reservoir properties on single and multiphase pressure behavior. Field observations of anomalous pressure behavior will be analyzed using the methods developed in this project," said White.

Other participants include fellow CCT faculty member Mayank Tyagi, assistant professor of the Department of Petroleum Engineering; Karsten Thompson, professor of LSU Department of Chemical Engineering; Stephen Sears, professional-in-residence in LSU Department of Petroleum Engineering; and Clint Willson, associate professor of the Department of Civil and Environmental Engineering.

The team's specialties include microtomography, petrography, reservoir engineering, image analysis, and computational fluid dynamics.

The project will use imaging resources at the Center for Advanced Microstructures & Devices (CAMD), and Argonne National Lab, and is especially relevant to oil and gas development in the U. S. Gulf of Mexico.

For more information on this research or other computational modeling activities, visit: http://www.cct.lsu.edu/home .

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