FRACTURED RESERVOIR SIMULATOR

ENERGY

Thermal physical model that simulates oil and gas recovery methods with a parallel discretization method for fractured reservoirs.

TECHNOLOGY TYPE
Oil & Gas
Software

STAGE OF DEVELOPMENT
Beta version available for enhanced oil recovery, CO_2 sequestration, and geothermal applications.

IP PROTECTION
U.S. Copyright Registered
  Reservoir Simulation of
  Complex Subsurface
  Processes
  TX0007146971

LEARN MORE
Reference Numbers: U-3602, U-4636, U-4654

Nick Wilkes
Technology Manager
nick.wilkes@tvc.utah.edu
801-587-0515

TECHNOLOGY SUMMARY
Fractured reservoirs are some of the most productive oil reserves in the world, but deviations in the geological formations surrounding the reservoir increase the time and cost of oil extraction. Oil and gas companies rely on advanced imaging techniques and computer generated models to determine how oil is flowing and manage surface parameters to get the most out of the reservoir. Fractured reservoir simulation, however, requires representing complex, irregular domains and complicated fracture networks that traditional simulation methods cannot handle.

The *Fractured Reservoir Simulator* uses control volume finite element formulations to enable field-wide reservoir simulation of complex domains and spatial fracture characterization. The simulator directly incorporates characterization of faults and fractures. Flux-based upstream weighting is employed to ensure flux continuity and solution stability. This enhances simulations by allowing for the combination of different physical and discretization models to cover a wider array of fractured reservoir characteristics.

FEATURES AND BENEFITS
- Enables simulation of highly complex fractured geologic systems.
- Facilitates modeling and discretization of complex systems.
- Ensures flux continuity and solution stability.
- Demonstrates potential for a variety of thermal recovery processes including steam flooding, in-situ combustion, and steam-assisted gravity drainage.

RECENT PUBLICATIONS
Fu, Y., Yang, Y., Deo, M. (2005). Three-dimensional, three-phase discrete-fracture reservoir simulator based on control volume finite element (CVFE) formulation. *Proceedings of SPE Reservoir Simulation Symposium.* doi: 10.2118/93292-ms

INVENTOR PROFILE
Milind D. Deo, Ph.D., Chair & Professor – Chemical Engineering

DATE UPDATED: 7/23/2019