COMPUTER MODELLING GROUP LTD.

IMEX

Black Oil & Unconventional Simulator

Benefits

- Quickly screen various recovery mechanisms before moving to more complex simulations
- Model complex hydraulic fracture networks, and all associated effects, to accurately history match field results
- Accurate modelling of the matrix-fracture transfer in fractured reservoirs
- Fast and easy transition to EOR process modelling in GEM™ and STARS™
- Seamless integration with CMOST AI for rapid history matching and optimization of reservoir management workflows

New Features

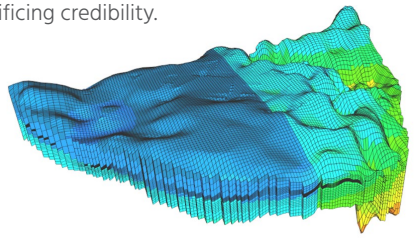
- Model advanced chemical EOR processes with new fluid models
- Capture the effect of salinity on polymer viscosity
- Account for fingering & physical dispersion effects of the slug during polymer injection
- Achieve substantial runtime improvements with new parallelization of the geomechanics module

IMEX, the world's fastest black oil reservoir simulator, is used to model primary, secondary, and tertiary oil recovery processes.

Conventional Reservoirs

IMEX™ models simple to structurally complex, heterogeneous, faulted oil and gas reservoirs, using small to very large scale multi-million grid cell models to achieve reliable production forecasts. Apply either the implicit/explicit method or the fully implicit method for faster calculations and to minimize run times without sacrificing credibility.

- Model different types of reservoir fluids, including: under-saturated and saturated oils, volatile oils, gas condensates, dry and wet gas reservoir fluid systems
- Select from multiple gridding options (Cartesian, radial, areal orthogonal & fully non-orthogonal corner point grids) to capture the best resolution
- Seamlessly interface with CMOST AI to facilitate rapid history matching and optimization of reservoir management workflows



Threshold pressure provides a more accurate representation of the reservoir's geology and fluid flow

Unconventional Reservoirs

IMEX incorporates sophisticated tools to model naturally or hydraulically fractured reservoirs to accurately capture transient flow behaviour and to achieve better production forecasts.

- Accurately simulate fluid transfer in a naturally fractured reservoir using different fracture models, which account for: gravity, re-infiltration and transient effects
- Model longitudinal or transverse bi-wing hydraulic fractures and complex hydraulic fracture networks through a Stimulated Reservoir Volume (SRV)
- Import third-party hydraulic fracture simulation data for better propped fracture characterization, history matching and forecasting
- Model variation in permeability along the length of the fracture to more realistically capture field conditions
- Accurately model the matrix-fracture and matrix-matrix transfer in naturally fractured reservoirs
- Utilize various correlations to capture the effect of non-Darcy flow inside hydraulic fractures
- Characterize geometry, shape and size of the SRV using microseismic data
- Achieve more reliable gas-in-place and reserves estimates by modelling adsorption gas contribution to production in shale and CBM reservoirs
- Integrate the geomechanical fracture model to design and optimize well completions
- Use CMOST AI to optimize well and fracture spacing to increase production, NPV and EUR
- Model naturally fractured reservoirs and gravity segregation processes using the multiple dual continuum options

Secondary & Tertiary Oil Recovery

Evaluate and optimize field development plans and predict recovery for primary and secondary recovery methods in complex and heterogeneous reservoirs.

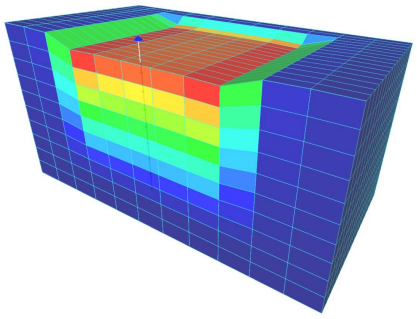
- Predict and compare reservoir performance by applying: water injection, polymer injection, pseudo-miscible gas injection, in continuous and WAG mode.
- Implement polymer related processes by modelling adsorption, polymer degredation, shear thinning and non-linear viscosity mixing
- Inject chase gas with different properties than the solution gas

IMEX

Geomechanics

IMEX includes a powerful rigorous, iteratively-coupled 3D geomechanics module to accurately model subsidence, compaction and dilation behaviour.

- Accurately model pore volume changes due to pore pressure changes with the newly implemented geomechanics coupling module
- Properly model fracture initiation and growth to understand fracturing mechanisms and impact of stress or strain dynamics
- Estimate fracture block permeability using normal fracture stress with the Barton-Bandis model
- Visualize hydraulic fracture initiation and propagation using discrete finite element
- Model and predict "fracture hits" incorporating flow and geomechanical models



Capture important geomechanical effects, such as surface subsidence (above), using the implicitly coupled geomechanics module

Coupled Surface Network Modelling

Create explicitly-coupled subsurface and surface network models, including onshore gas storage fields and deep water offshore oil and gas fields.

- Couple to third-party surface network simulators to model more complex (e.g. looped) surface networks
- Troubleshoot bottlenecks in the entire reservoir and surface network system with coupled system modelling

iSegWell

iSegWell™, an intelligent segmented wells module in IMEX, accurately and realistically models the flow and pressure change throughout the wellbore branches, tubing strings and equipment.

- Wellbore modelling for gravity and frictional pressure losses (horizontal & multi-lateral wells, downhole equipment, tubing)
- Increase well capability by simultaneously optimizing well design and reservoir productivity
- Define and use non-standard Flow Control Devices (FCDs) to optimize injection and production strategy

Performance

CMG's solver and parallelization technology maximizes hardware potential and provides software that runs large, complex simulation jobs in the shortest amount of time.

- Achieve reduced run-time and solver iterations with CMG's combinative solver
- Run more simulation jobs simultaneously and get results faster than before
- Additional parallelization increases parallel speed-up when jobs are submitted on a higher number of cores
- Reduce capital expenditures with efficient use of IT computer hardware
- Maximize productivity by quickly loading results of large models using the standardized and compressed SR3 files
- Apply Dynamic Grid (DynaGrid) amalgamation to significantly speed up simulation models, while maintaining accuracy in important regions of the reservoir

Contact

For more information please contact **sales@cmgl.ca**

R&D Investment

CMG reinvests 20% annual revenue back into R&D, to further innovation and drive technology forward

Superior Software

CMG delivers easy to use software that provides the most accurate results

Dedicated Support

Experienced technical sales & support personnel, deliver high-quality, timely and personalized customer support

Relevant Training

CMG's industry renowned reservoir software training provides the skills to improve productivity and efficiency