# Software

## Reservoir Simulation | Software

Many software, private, open source or commercial, are available for reservoir simulation. The most well knows are:

**Commercial:**

**Rock Flow Dynamics tNavigator** supports black oil, compositional and thermal compositional simulations for workstations and High Performance Computing clusters

**CMG** Suite (IMEX, GEM and STARS) – Computer Modelling Group currently offers three simulators: a black oil simulator, called IMEX, a compositional simulator called GEM and a thermal compositional simulator called STARS.

*IMEX model*

*Results 3D image of a large conventional field.*

*Gas is indicated by pink, oil by green, and water by blue*

**Schlumberger Eclipse Suite** (E100, E300, EAdvanced) – ECLIPSE is an oil and gas reservoir simulator originally developed by ECL (Exploration Consultants Limited) and currently owned, developed, marketed and maintained by SIS (formerly known as GeoQuest), a division of Schlumberger. The name ECLIPSE originally was an acronym for “EC´s Implicit Program for Simulation Engineering”. ECLIPSE 100 solves the black oil equations (a fluid model) on corner-point grids. ECLIPSE 300 solves the reservoir flow equations for compositional hydrocarbon descriptions and thermal simulation.

*Fluid Saturation from a full-field Eclipse Simulation*

**Landmark Nexus** – Landmark Nexus is an oil and gas reservoir simulator originally developed as 'Falcon' by Amoco, Los Alamos National Laboratory and Cray Research. It is currently owned, developed, marketed and maintained by Landmark Graphics, a product service line of Halliburton. Nexus will gradually replace VIP, or Desktop VIP, Landmark's earlier generation of simulator.

*3D visualization in Nexus View ™ software*

**Open Source:**

**BOAST** – Black Oil Applied Simulation Tool (Boast) simulator is a free software package for reservoir simulation available from the U.S. Department of Energy. Boast is an IMPES numerical simulator (finite-difference implicit pressure-explicit saturation) which finds the pressure distribution for a given time step first then calculates the saturation distribution for the same time step isothermal. The last release was in 1986 but it remains as a good simulator for educational purposes.

**MRST** – The MATLAB Reservoir Simulation Toolbox (MRST) is developed by SINTEF Applied Matemathics as a MATLAB® toolbox. The toolbox consists of two main parts: a core offering basic functionality and single and two-phase solvers, and a set of add-on modules offering more advanced models, viewers and solvers. MRST is mainly intended as a toolbox for rapid prototyping and demonstration of new simulation methods and modeling concepts on unstructured grids. Despite this, many of the tools are quite efficient and can be applied to surprisingly large and complex models.

**OPM** – The Open Porous Media (OPM) initiative provides a set of open-source tools centered around the simulation of flow and transport of fluids in porous media.