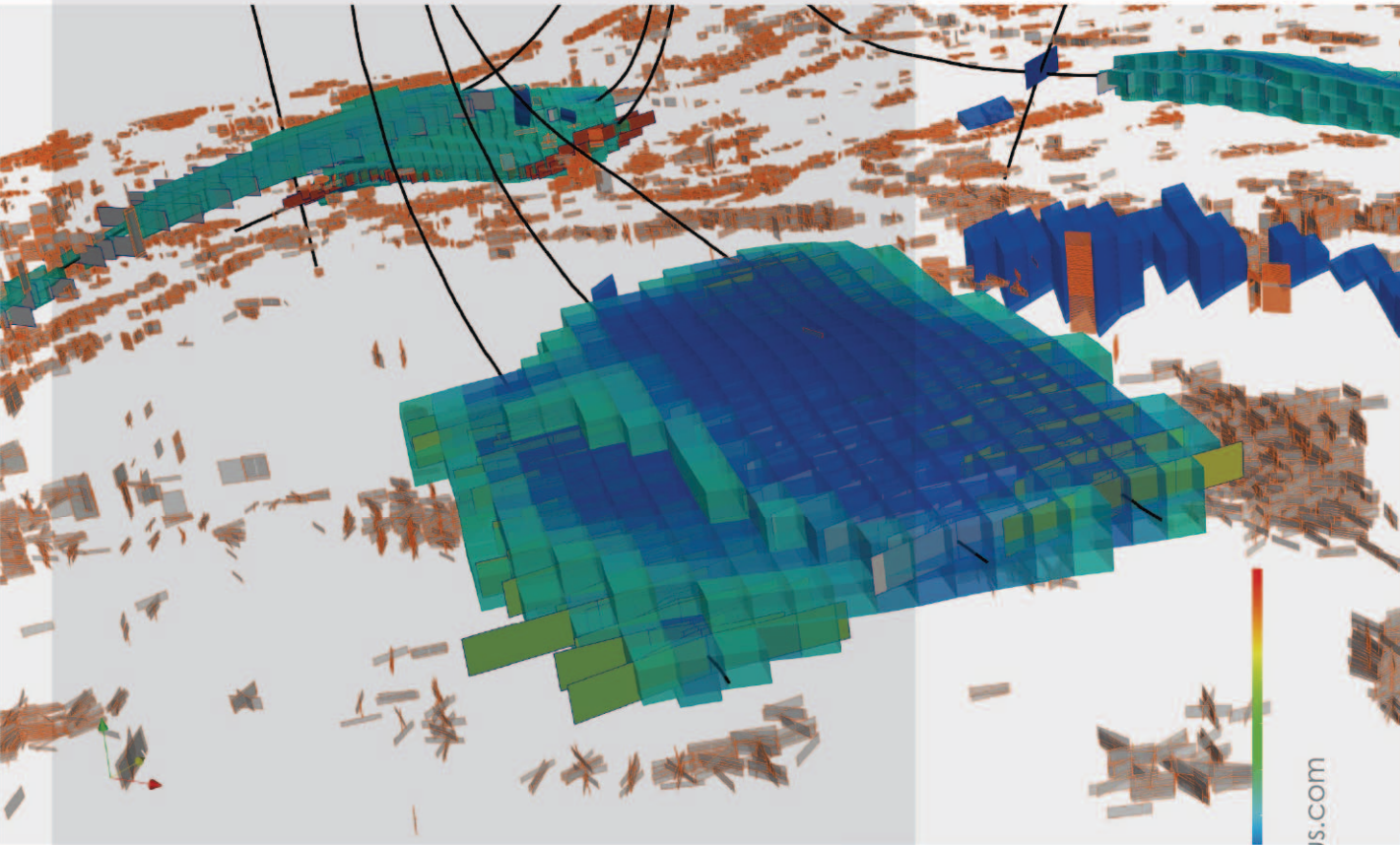


The first and best **EDFM** Fracture
Modeling Solution



EDGSSuite 2020

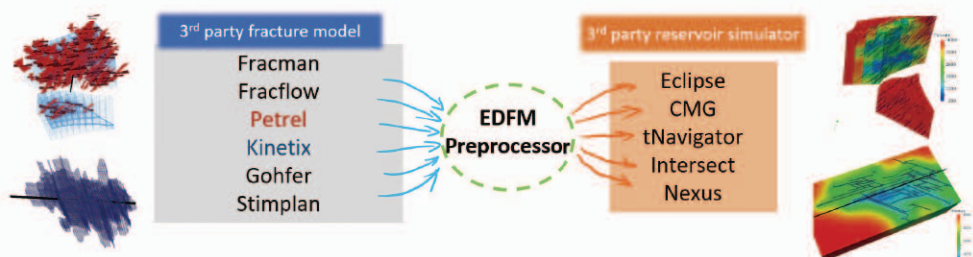
Embedded Discrete Geometry Simulation

EDGSSuite 2020

Embedded Discrete Geometry Simulation

We devoted our energies to make the fractured reservoir simulation workflow easier and faster.

- A powerful EDFM tool to couple realistic fracture models to any reservoir simulation with true fracture geometry
- A creative workflow to enable any third-party reservoir simulator to deal with complex fracture geometry in reservoir simulation

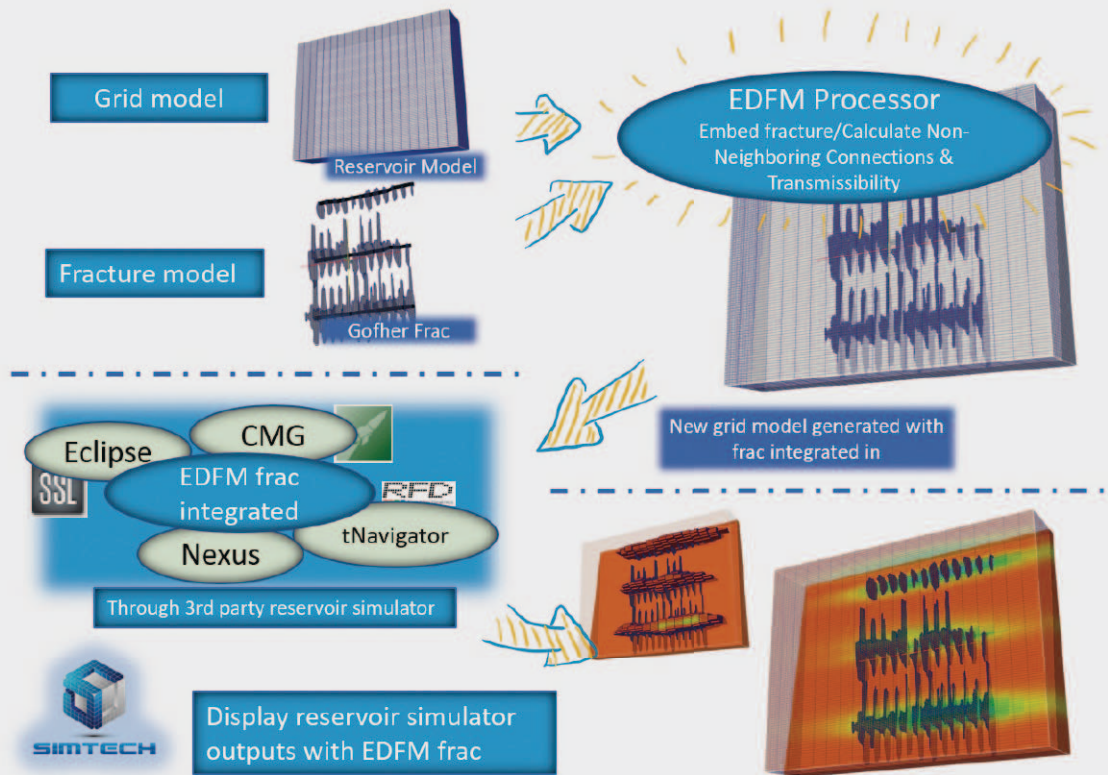


No need to: build a new reservoir model, buy a new fancy expensive simulator, purchase super computer. **Save time and money!**

Data transfer module that streamlines the workflow. EDFM will import 3rd party's fractures directly into your existing simulator.

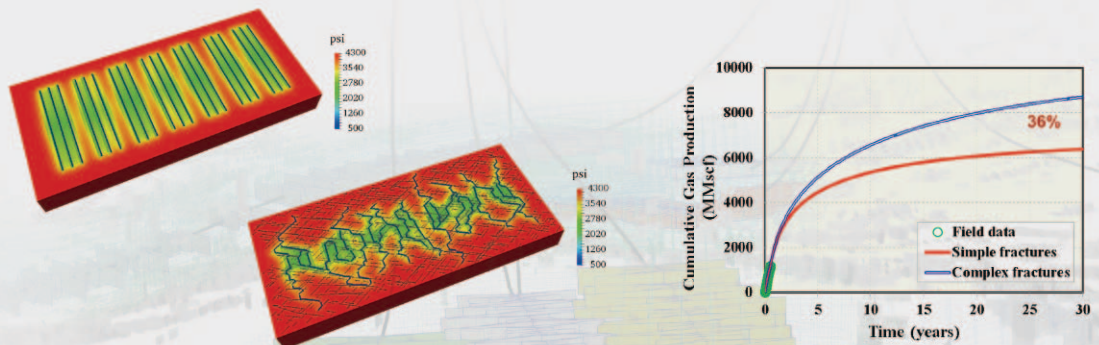
Highlights for our EDGSSuite 2020

- First commercialized EDFM processor in the world
- Upgraded EDFM preprocessor and more friendly interface
- Powerful 3D EDFM for any complex fracture geometries
- Extend 3D EDFM for commercial simulators in a non-intrusive manner
- Perform extensive evaluation of its accuracy and efficiency
- Proven technologies with multiple field-scale applications
- 12 years of development experience and many publications



Workflow from Hydraulic fractures(Gopher) to reservoir simulator through EDFM.

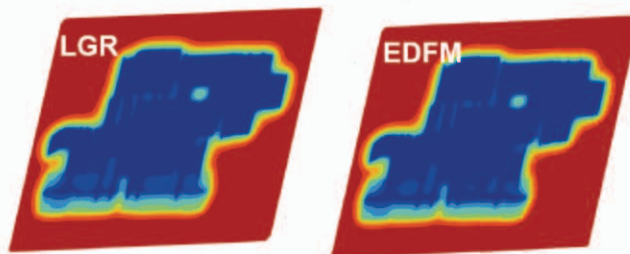
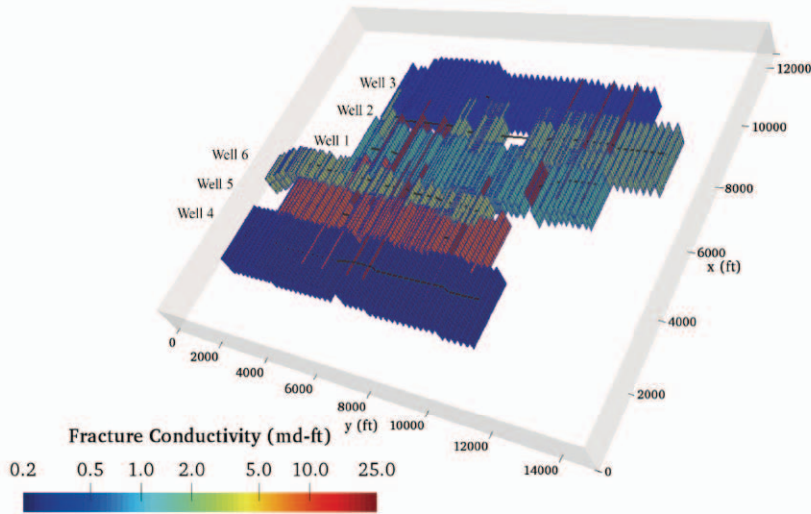
Traditional fracture simulation method underestimates the impact of natural fracture and the complexity of fractures.



Pressure profiles after 3 months (Simple fracture geometry vs complex fracture geometry)

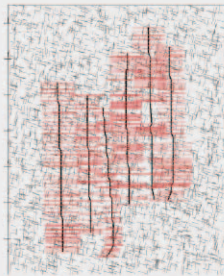
36% EUR difference is indicated after 30 years.

Field application in Niobrara tight gas with strong well interference due to fracture hits (Xu et al., 2018)

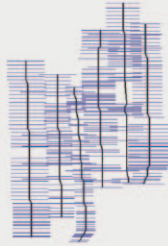


Fracture model	Number of gridblocks	CPU time (second)	Ratio of CPU time (LGR/EDFM)
EDFM	291,900	1,589	14 (history) 20 (forecasting)
		1,763	
LGR	855,750	21,720	
		33,619	

EDFM require less cells in model, Faster and Easier for engineer to setup model, run simulations, and report results.



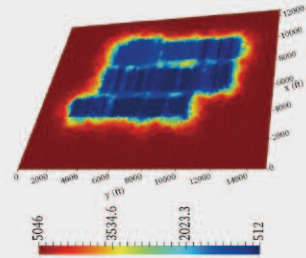
Natural fracture distribution



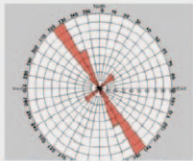
6 wells



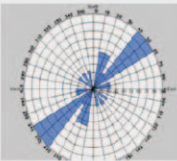
3 wells



Pressure distribution



One set NF

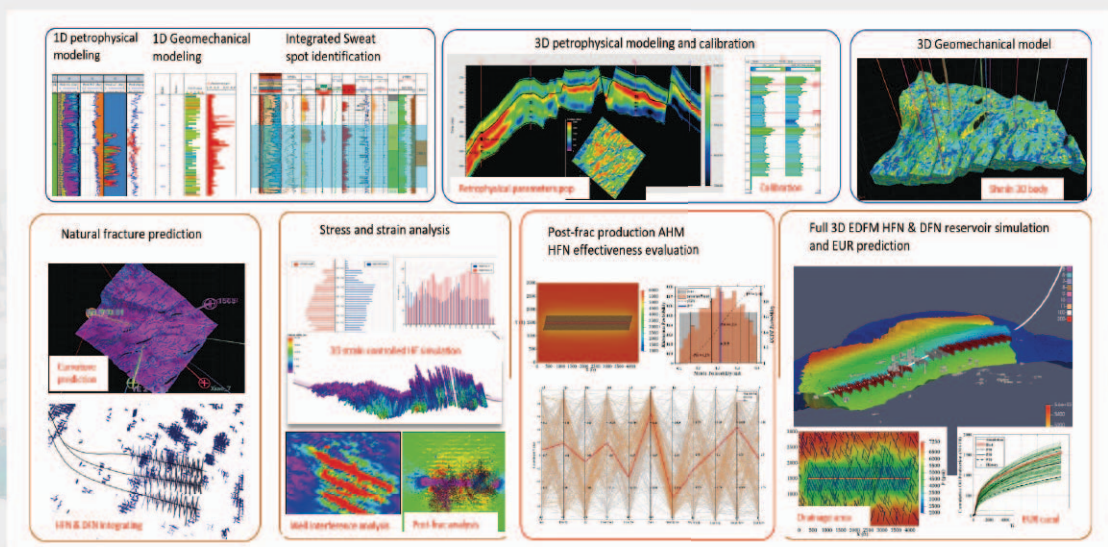


Second set NF

Comparison of EUR	Well Number	EUR of 3 wells / EUR of 6 wells
With natural fractures	3	70%
	6	

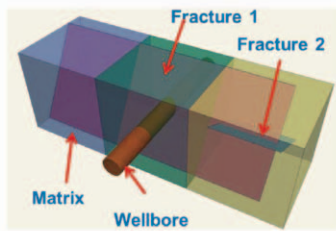
Massive natural fractures could be introduced into the model by EDFM to test more realistic scenarios, powerful tool to conduct well space optimization studies.

A new EDFM HFN + DFN workflow integrated with G&G study



The following will be performed by EDFM Processor:

1. Create additional fracture grids
2. NNC-Non-neighboring connections
3. Transmissibility calculation



$$Q = T \lambda \Delta P$$

M	M	M
F1	F1	F1
F2	Null	Null

