Simple CMG running tutorial for Reservoir geomechanics HW3

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CMG simulation, reservoir depletion and changes of stress.

I attached files for CMG simulation with geomechanics named “Injection1.dat” and “Production1.dat”. The files solve injection and production of water from water saturated reservoir surrounded by a solid (geomechanics) domain.

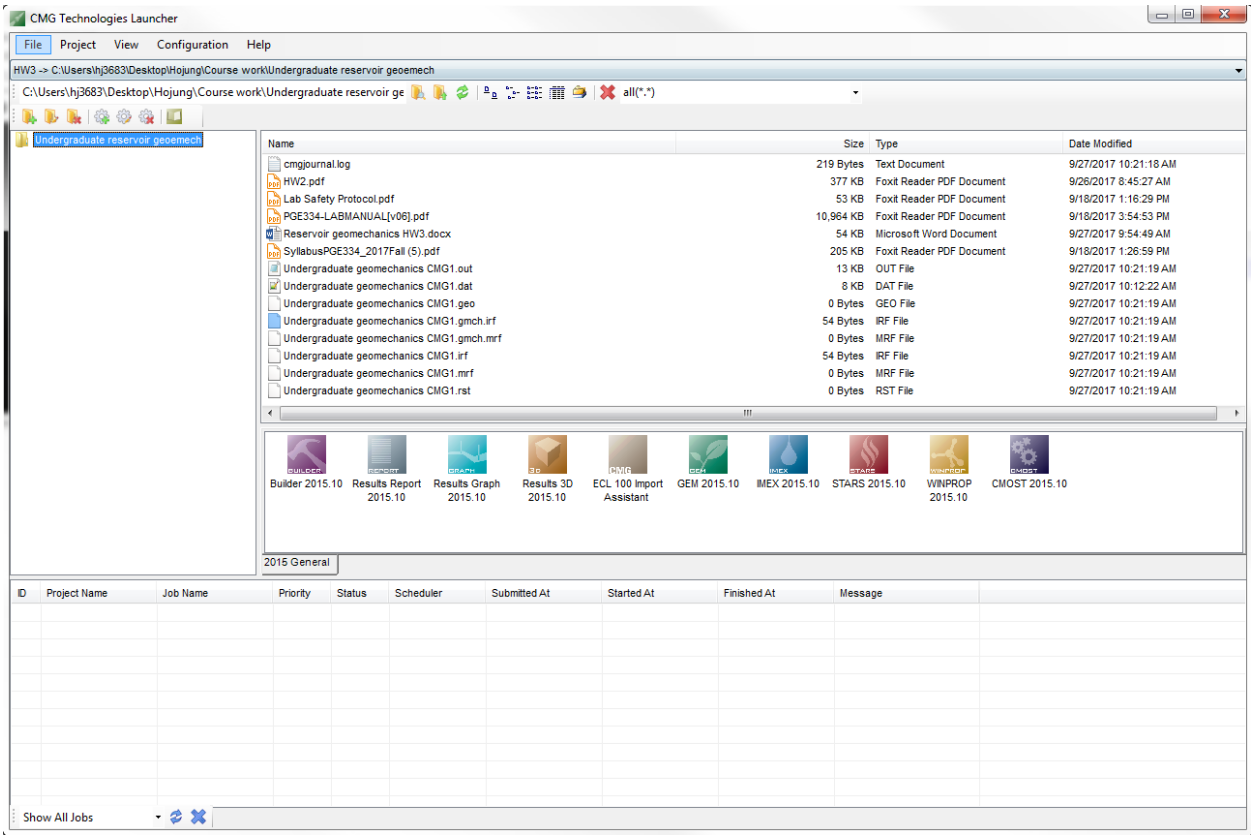
1. Running simulation

1) You need to open “Launcher” first.

2) Make the project where you want to locate your folder.

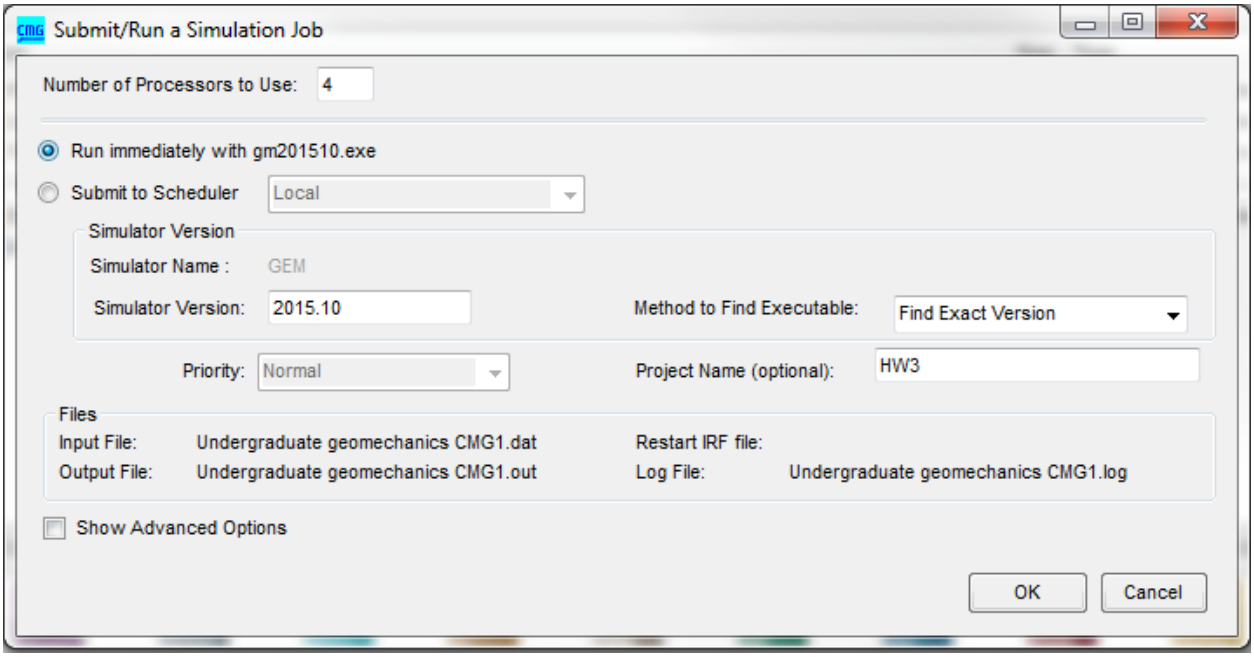
3) Put the CMG simulation file under the folder.

4) Drag it to “GEM icon” 

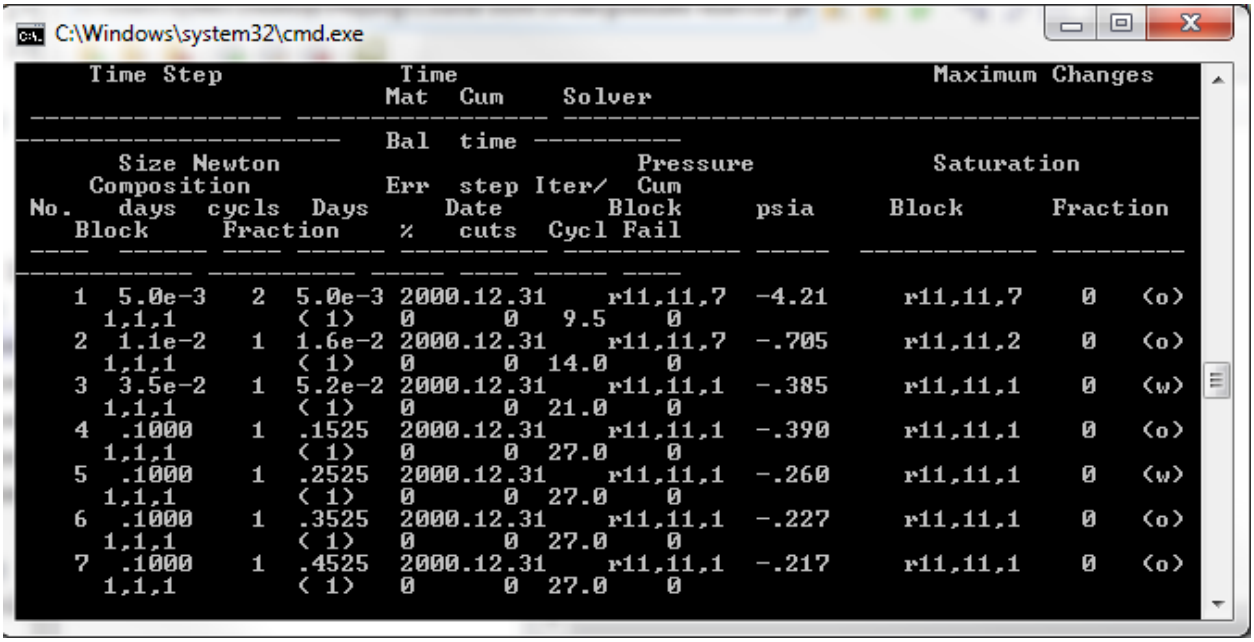

CMG Technologies Launcher
File
Project
View
Configuration
Help
HW3 -> C:\Users\hj3683\Desktop\Hojung\Course work\Undergraduate reservoir geoemech
C:\Users\hj3683\Desktop\Hojung\Course work\Undergraduate reservoir ge
all(*.*)
Undergraduate reservoir geoemech
Name
Size
Type
Date Modified
cmgjournal.log 219 Bytes Text Document 9/27/2017 10:21:18 AM
HW2.pdf 377 KB Foxit Reader PDF Document 9/26/2017 8:45:27 AM
Lab Safety Protocol.pdf 53 KB Foxit Reader PDF Document 9/18/2017 1:16:29 PM
PGE334-LABMANUAL[v06].pdf 10,964 KB Foxit Reader PDF Document 9/18/2017 3:54:53 PM
Reservoir geomechanics HW3.docx 54 KB Microsoft Word Document 9/27/2017 9:54:49 AM
SyllabusPGE334_2017Fall (5).pdf 205 KB Foxit Reader PDF Document 9/18/2017 1:26:59 PM
Undergraduate geomechanics CMG1.out 13 KB OUT File 9/27/2017 10:21:19 AM
Undergraduate geomechanics CMG1.dat 8 KB DAT File 9/27/2017 10:12:22 AM
Undergraduate geomechanics CMG1.geo 0 Bytes GEO File 9/27/2017 10:21:19 AM
Undergraduate geomechanics CMG1.gmch.irf 54 Bytes IRF File 9/27/2017 10:21:19 AM
Undergraduate geomechanics CMG1.gmch.mrf 0 Bytes MRF File 9/27/2017 10:21:19 AM
Undergraduate geomechanics CMG1.irf 54 Bytes IRF File 9/27/2017 10:21:19 AM
Undergraduate geomechanics CMG1.mrf 0 Bytes MRF File 9/27/2017 10:21:19 AM
Undergraduate geomechanics CMG1.rst 0 Bytes RST File 9/27/2017 10:21:19 AM
Builder 2015.10
Results Report 2015.10
Results Graph 2015.10
Results 3D 2015.10
ECL 100 Import Assistant
GEM 2015.10
IMEX 2015.10
STARS 2015.10
WINPROP 2015.10
CMOST 2015.10
2015 General
ID
Project Name
Job Name
Priority
Status
Scheduler
Submitted At
Started At
Finished At
Message
Show All Jobs

5) Once you get this “Submit/Run a Simulation Job” window, check the “Run immediately with gm201XXX.exe”

And then press “OK” to submit simulation



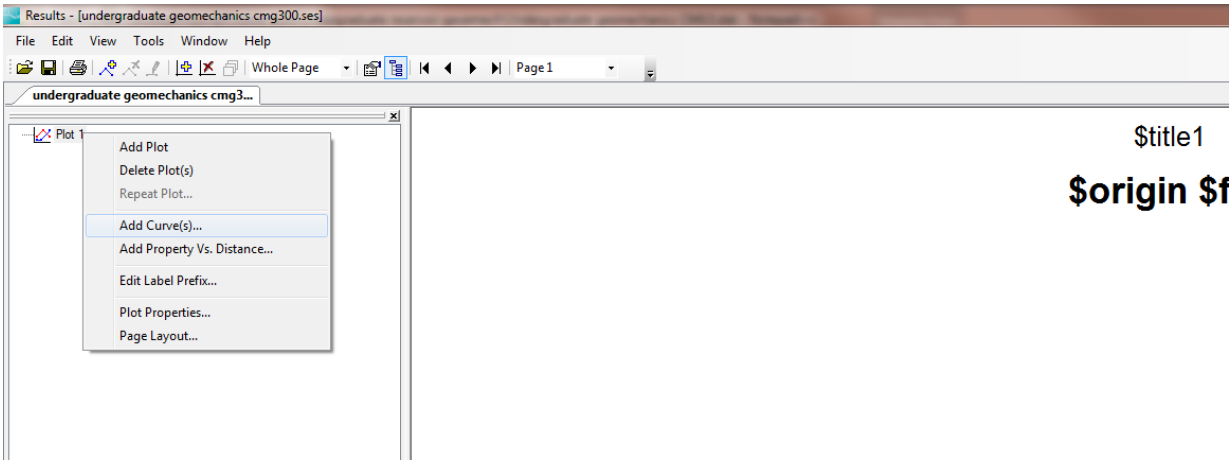
6) You will see this window, once you press the “OK”. You can check here how much the simulation has been run.



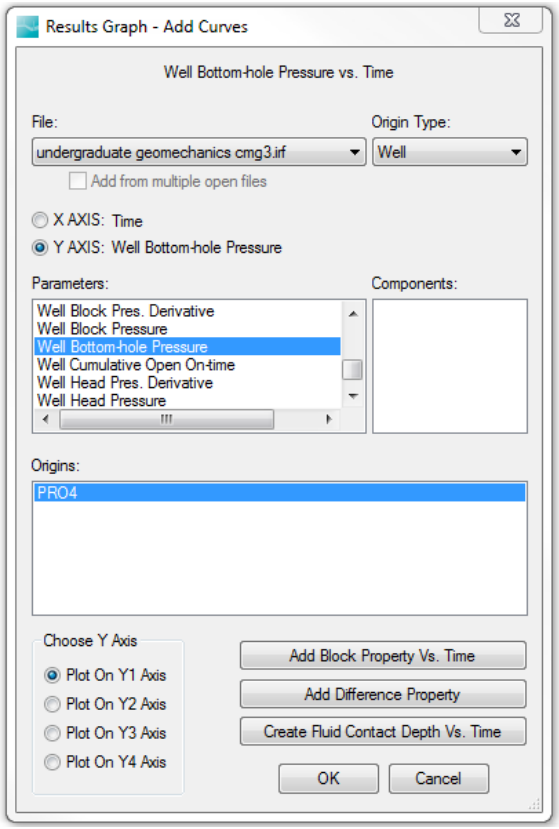
2. Plotting the result

1) When the simulation is finished, you need to drag XXX.irf file to “Results Graph”

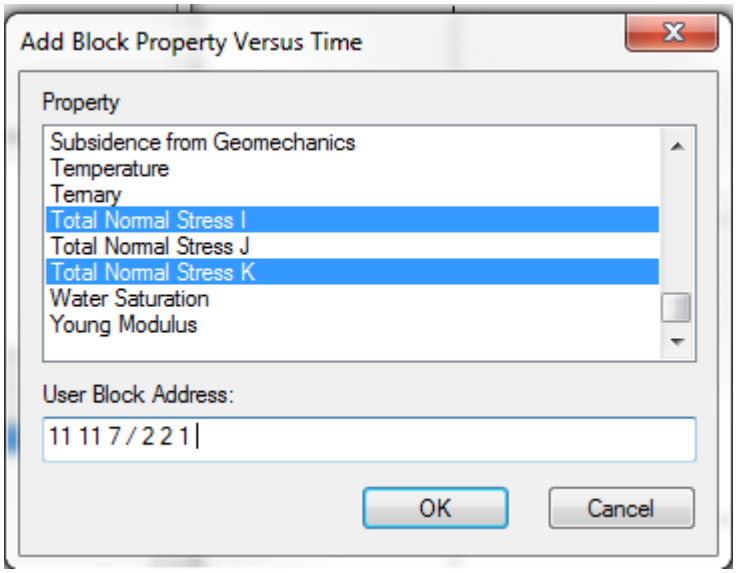
2) You do right click of Plot 1, and add Curve(s),



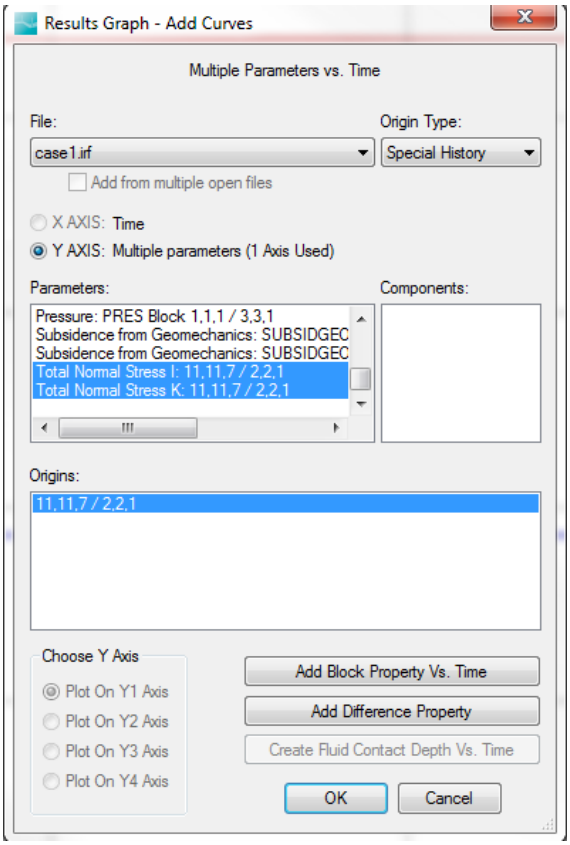
3) Click “Well Bottom-hole Pressure”



4) To add more curves, on the above window, click “Add Block Property Vs Time”

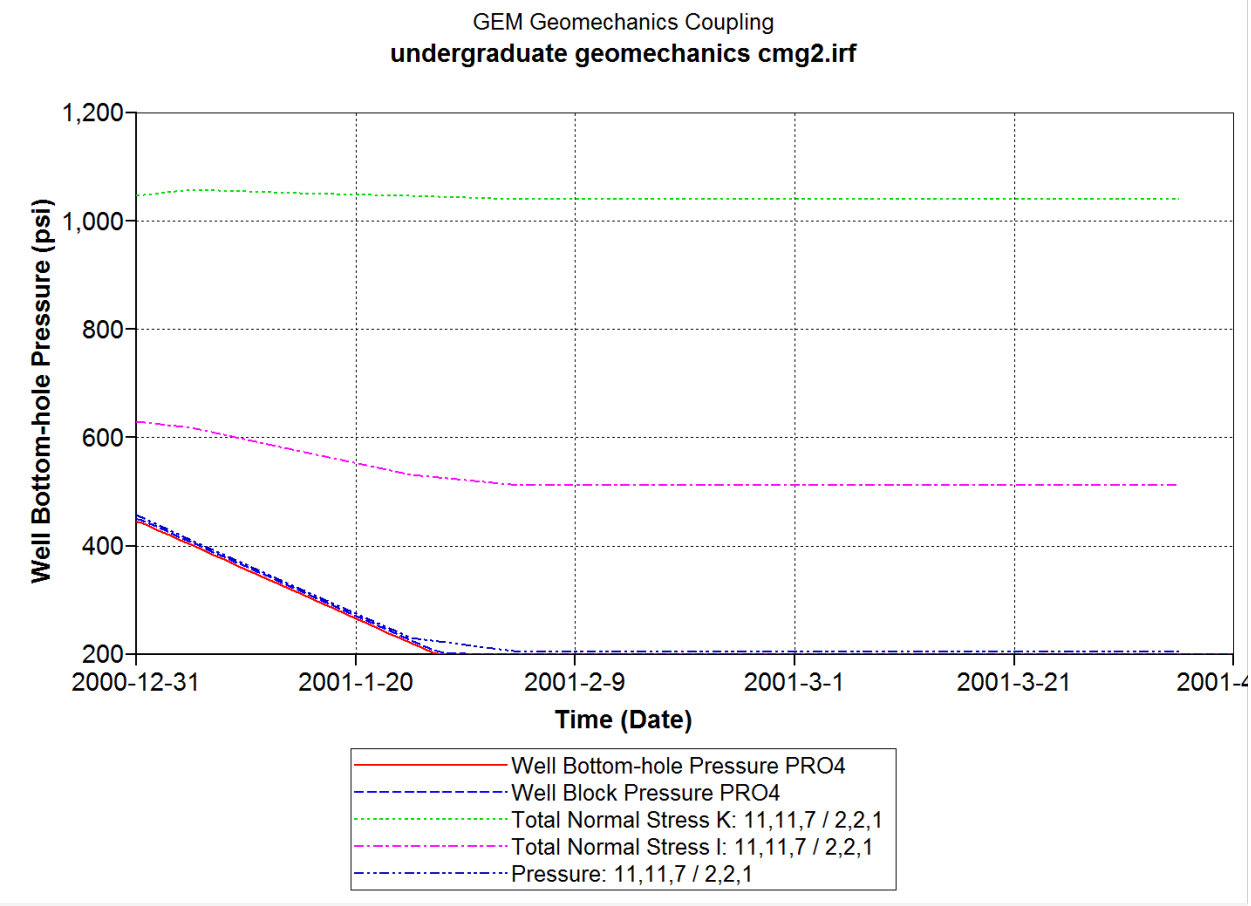


Check Total Normal Stress I (it is your minimum principal stress) and Total Normal Stress K (Vertical stress). Type “11 11 7 / 2 2 1” for User Block Address



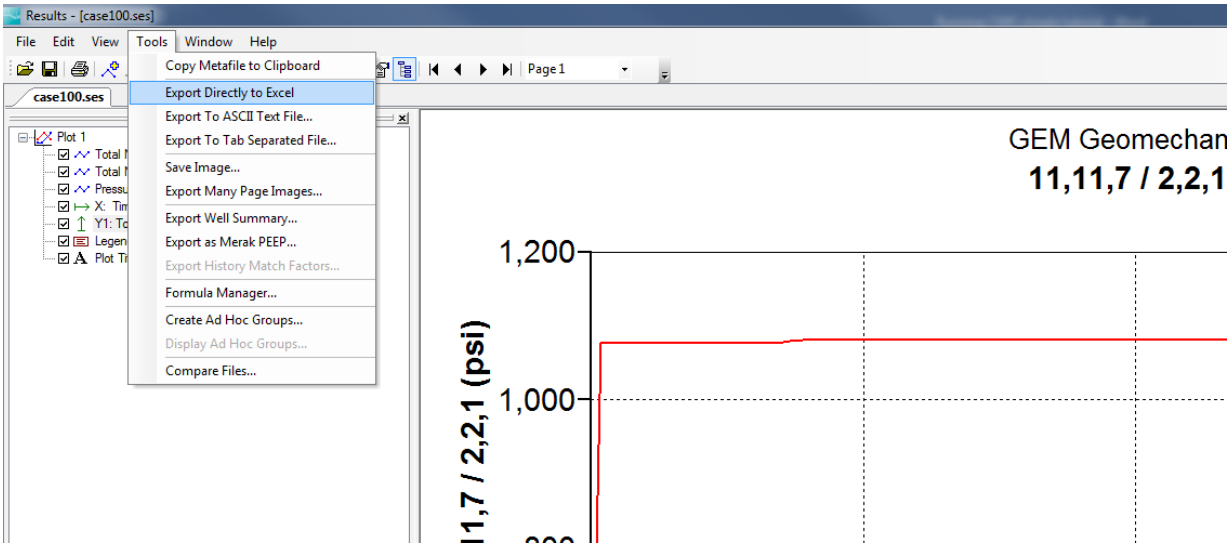
4) Now you will have total normal stress I, K and Press at that block on the list of parameters

5) You need to plot it



This is not the exact simulation that I gave you. It will be similar or not.

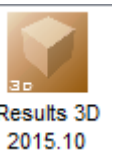
6) To export the data to Excel, click “Tool” -> “Export Directly to Excel”



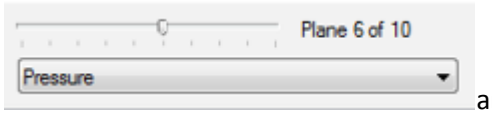
7) Now you have pore pressure, min. horizontal stress, and vertical stress

3. Visualizing the simulation results

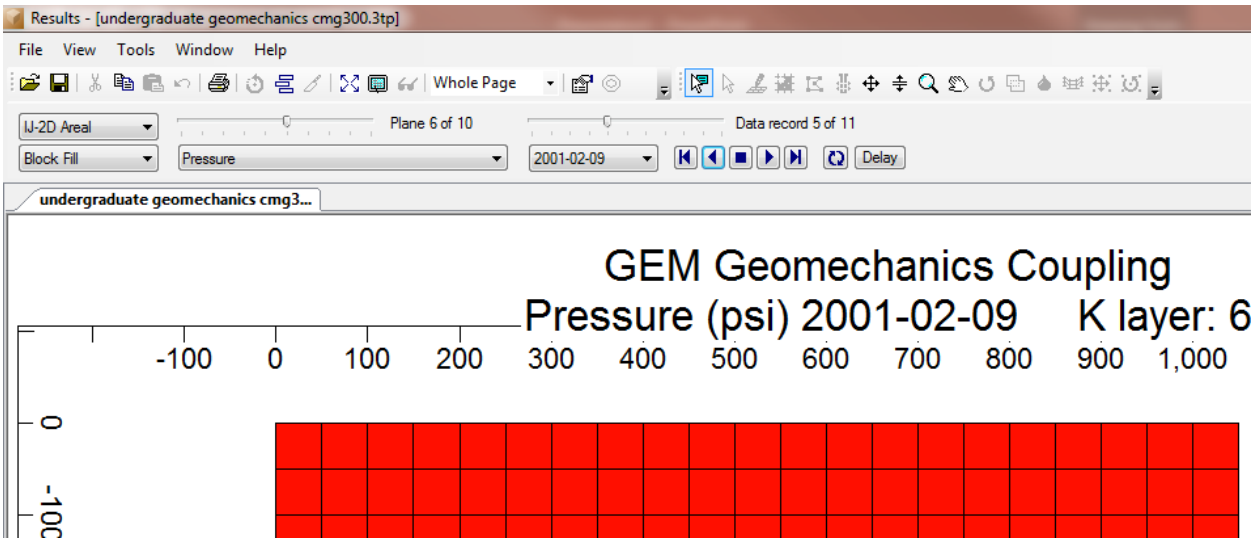
1) you need to drag XXX.irf file to “Results 3D”



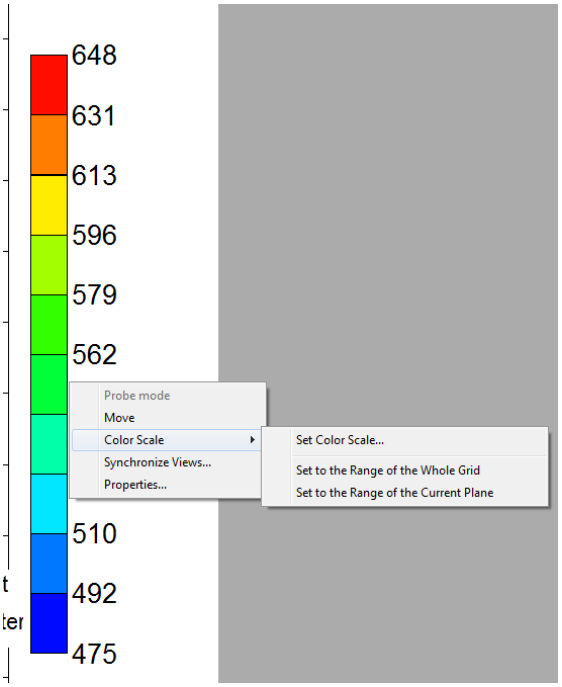
2) Click “Pressure” or “Total Normal Stress”



and change the Plane. Plane 1 is the top, and Plane 6, 7, and 8 are where the well is perforated.



3) Adjust color scale, right click on the color scale bar, and then click the “Set to the Range of the Current Plane” or “Set Color Scale”



4) You will see the result looks like this.