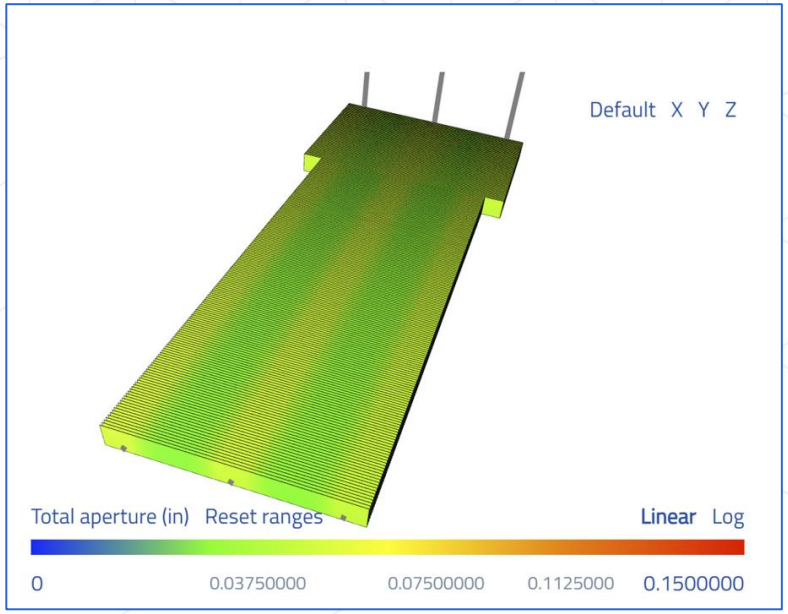
ResFrac

PREEXISTING FRACTURES

	Center x-coordinate [ft]	Center y-coordinate [ft]	Center z-coordinate [ft]	Fracture full-length [ft]	Fracture full-height [ft]
1					

New Row Resize Table

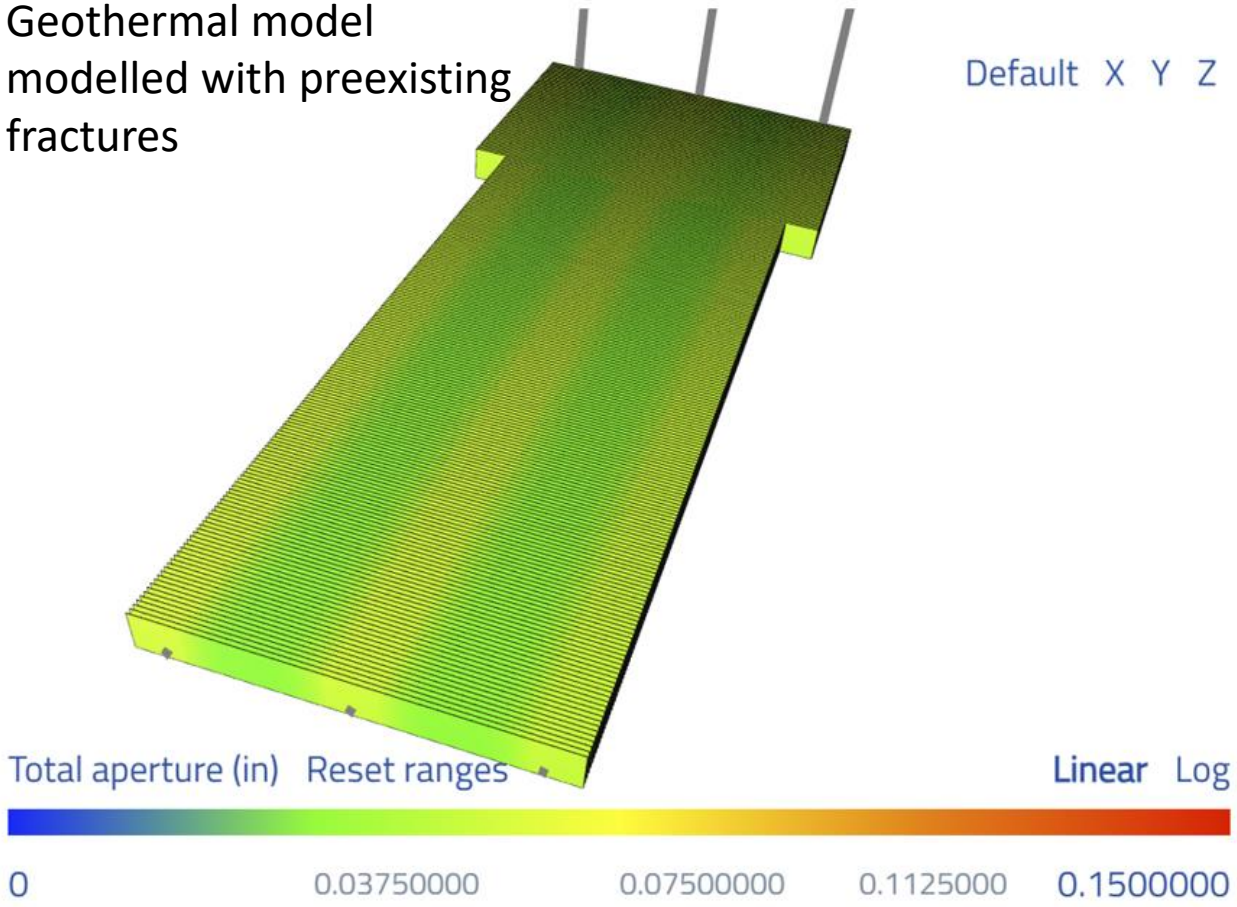


Preexisting Fractures

Explicitly meshed fractures that are not created through stimulation

Preexisting Fractures

Geothermal model modelled with preexisting fractures



Preexisting fractures can be used for a variety of reasons:

- Geological Features
  - Natural fractures
  - Faults
- Simulation Speed
  - Preexisting fractures can be used in placed of simulated fractures without having to use simulation time to frac the well, such as offset parent wells, depletion etc.
  - Additionally, they can be used for longer lateral simulation such as in geothermal studies.

Preexisting Fractures – Same concept as ZPCs except easier!

PREEXISTING FRACTURES

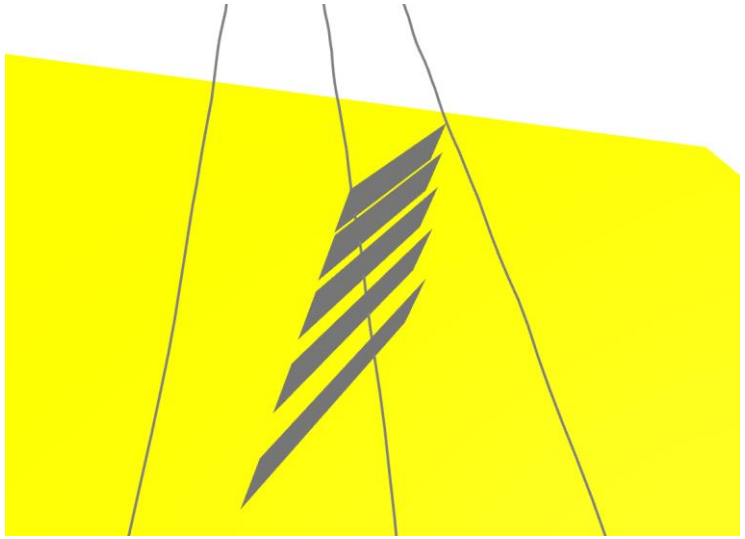
	Center x-coordinate [ft]	Center y-coordinate [ft]	Center z-coordinate [ft]	Fracture full-length [ft]	Fracture full-height [ft]	Orientation (clockwise from positive y-direction) [degrees]
1	-100	0	9800	600	300	20
2	-100	-400	9800	600	300	20
3	-100	400	9800	600	300	20
4	-100	-200	9800	600	300	20
5	-100	200	9800	600	300	20

New Row Resize Table

1) Locate the center. You can use the wellbore survey or perf coordinates in the Wells and Perforations Tab to help.

2) Specify the height and width.

3) Specify the rotation. As before, this is measured from the positive y-axis.



Static Model and Initial Conditions - Advanced

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Preexisting Fractures – Defining the conductivity

E0 [ft]	Eres [ft]	90% closure stress [psi]	Unpropped conductivity (optional) [md-ft]	Unpropped conductivity stress dependence (optional) [psi^-1]
0.000492	0.00000656167979002624	500	10	0.005

If defined, then this will override the unpropped fracture conductivity that was set up in the static model by layer and is governed by the below equation.

$$E = \frac{E_0}{1 + \frac{9(\sigma_n - P)}{\sigma_{n,ref}}} + E_{res}$$

Increasing E_o and $\sigma_{n,ref}$ are generally used to increase the unpropped fracture conductivity.

If this is defined, then it will override the unpropped fracture conductivity specified to the left and in the static model. The initial unpropped fracture conductivity is specified and if desired an unpropped conductivity stress dependence can be defined using the following relationship. A value of 0.005 is a good starting point.

Adjustment = exp(-conductivitystressdependence*(sn - P)).

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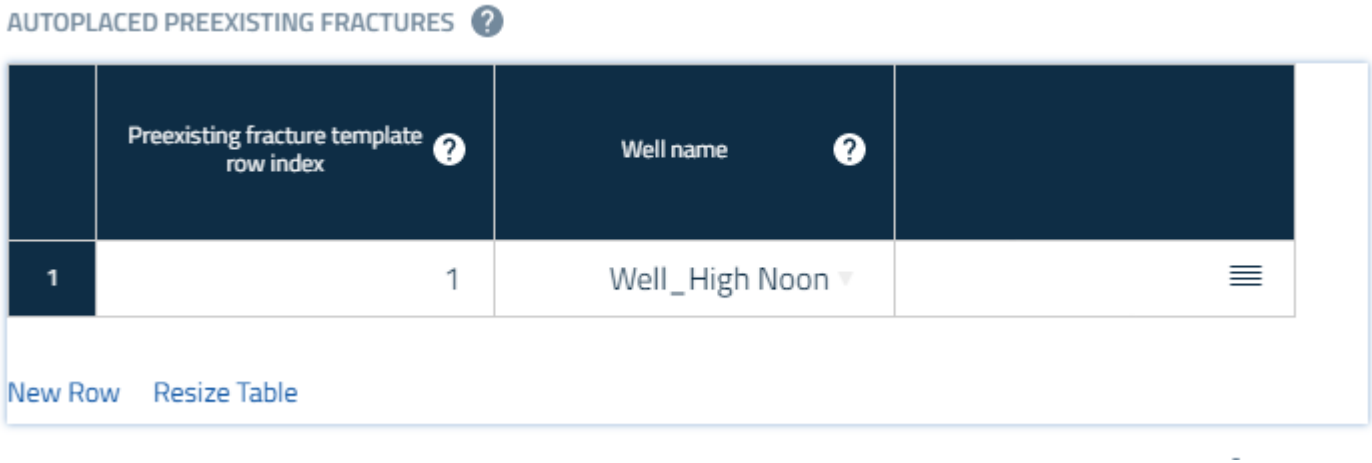
Preexisting Fractures – Defining Multiple Fractures Easily Along a Wellbore



Often, we would like to use preexisting fractures to simulate real fractures without having to frac the well.

An easy way to do this is to use the ‘Autoplaced Preexisting Fracture Table’ located in the advanced section of the Static Model and Initial Conditions Tab.

Step 1: Set up a wellbore and use the inline perforating wizard to set up perforations along the wellbore.

Step 2: As shown in the previous slide, set up one or more fracture templates.

Step 3: In the ‘Autoplace Preexisting Fracture’ table, specify the row number of the preexisting fracture you want to replicate from the ‘Preexisting Fracture’ table.

Step 4: Specify the well that you want to have the preexisting fractures. ResFrac will ignore the x, y and z coordinates of the fracture specified and place identical fractures at every perforation location.

Now you don’t have to frac the well to simulate production!

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Thank You!

Chris Ponners
cponners@resfrac.com

Last updated Feb 2026