



# Understanding the stimulation of deep geothermal reservoirs through modeling and simulation

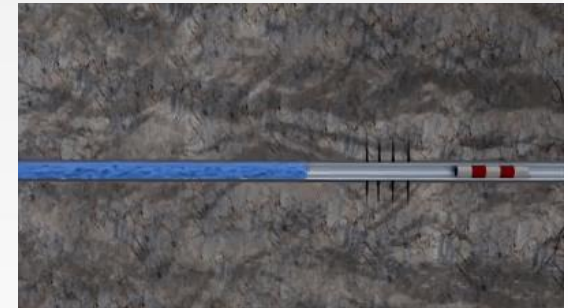
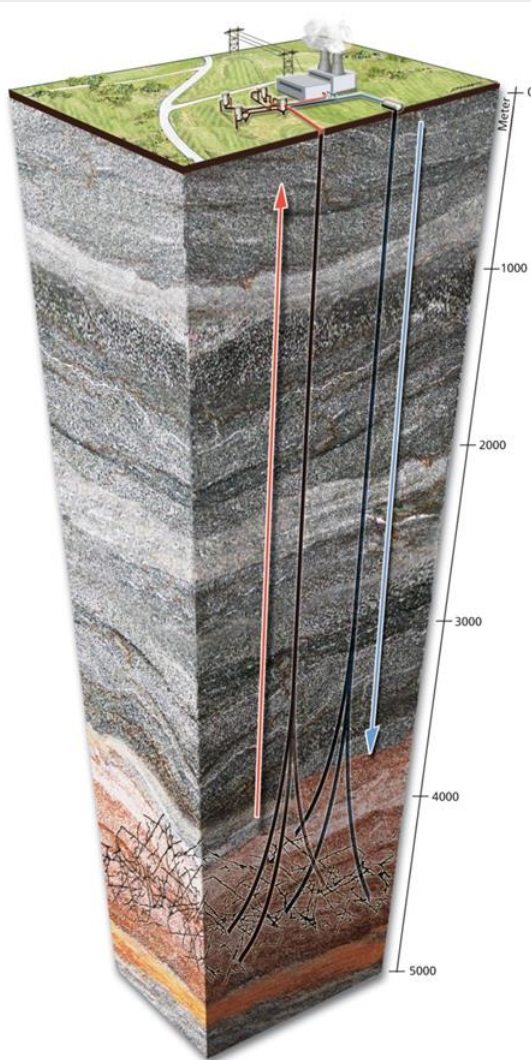
Eren Ucar





# Why hydraulic stimulation?

- Low permeable geothermal resources are not economically viable
- Enhanced Geothermal Systems (Enhancing the fluid circulation)
- Fracture Stimulation
  1. Fractures are initiated and propagated

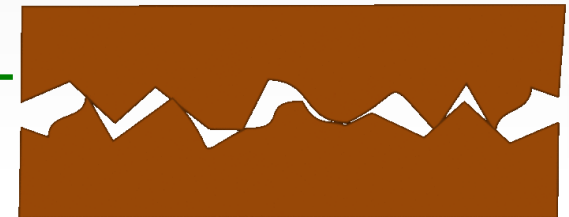
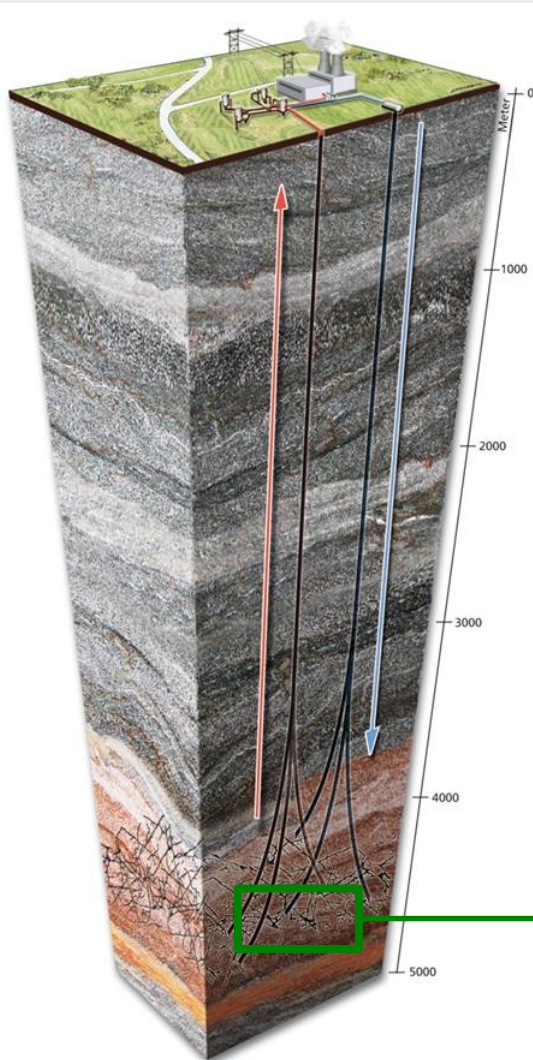


Source: Marathon Oil Corp.



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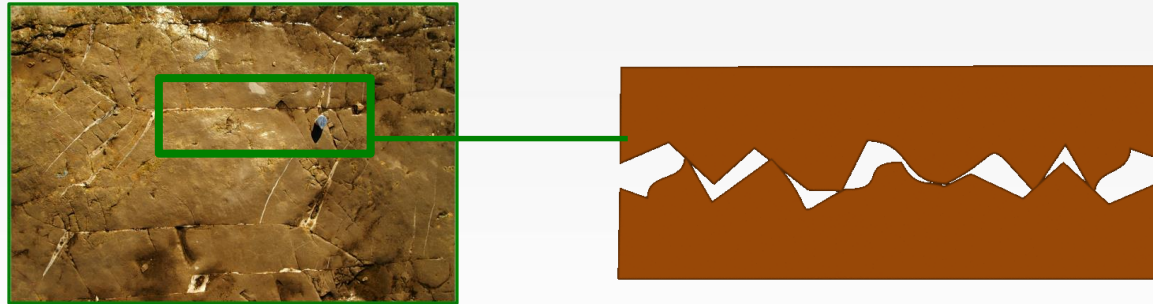
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- Fracture Stimulation
  1. Fractures are initiated and propagated
  2. Existing fractures stimulated (Shearing)





# Why modeling?

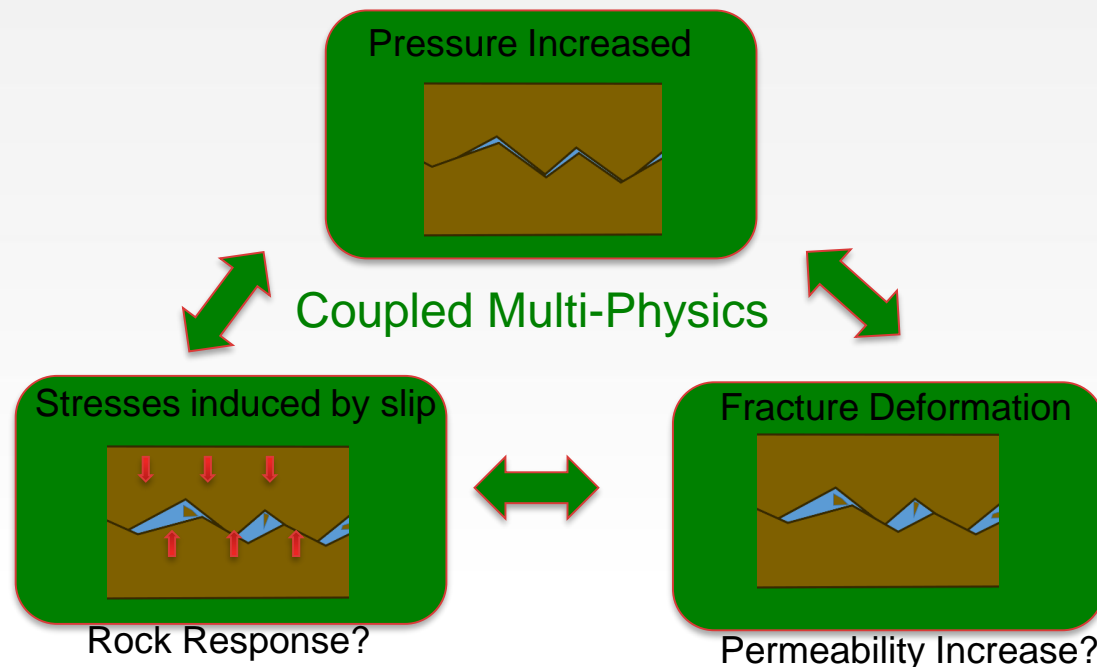
- Developing a computational model to mimic shear dilation treatment (computer code)
  - Understanding the physics processes
  - How much enhancement of permeability?
  - (Un)controllable by-product: induced seismicity





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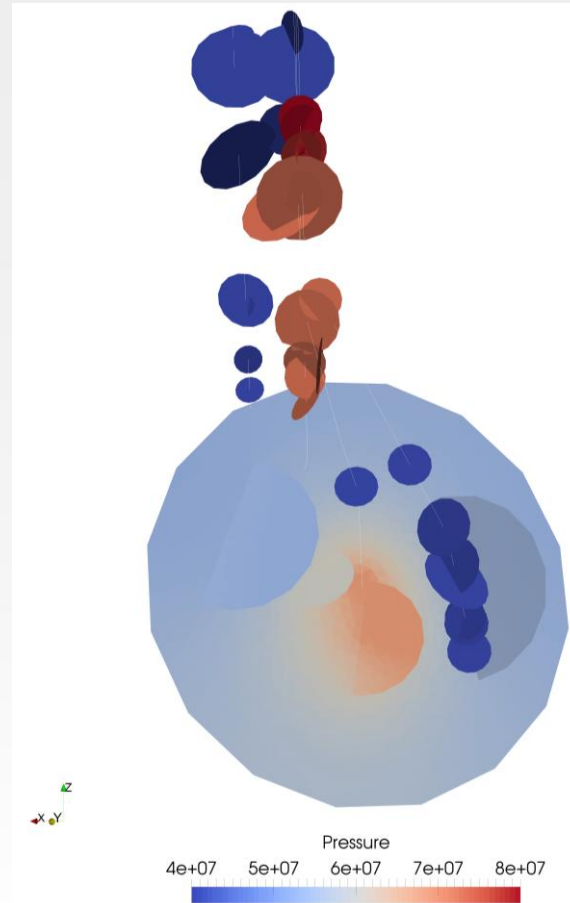
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# 3D Modeling

## Real fracture network





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