A P3D model for fracture growth across multiple elastic layers

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In this talk, we will present a P3D model for a planar fracture propagating vertically across multiply elastic layers. In the model, we consider the material property contrasts across the layers in the plane-strain deformation solver. Instead of using the pressure as the adjusting parameter, the constraint on fluid volume of each cell is employed. Numerical stability is maintained and the parallel computing algorithm is used to accelerate computation.

Following [1], we considered the viscosity effect on fracture growth. The interaction among cells in the P3D model is considered by an undetermined factor. This factor is determined by comparing the results with the planar 3D results presented in [1].

The model simulates the proppant transport in the fracture based on the equations used in [2]. The proppant settling is assumed to instantly occur and a steady-state proppant distribution is rapidly reached in each cell. This treatment can accelerate the computation too.

Some of the outcomes have been published in [3] and [4].

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References

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