

Abstract Submitted  
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**Fluid-driven Fractures and Backflow in a Multilayered Elastic Matrix**<sup>1</sup> SAMUEL SMIDDY, Department of Chemical and Biological Engineering, Princeton University, CHING-YAO LAI, HOWARD STONE, Department of Mechanical and Aerospace Engineering, Princeton University — We study the dynamics when pressurized fluid is injected at a constant flow rate into a multi-layered elastic matrix. In particular, we report experiments of such crack propagation as a function of orientation and distance from the contact of the layers. Subsequently we study the shape and propagation of the fluid along the contact of layers as well as volume of fluid remaining in the matrix once the injection pressure is released and “flowback” occurs. The experiments presented here may mimic the interaction between hydraulic fractures and pre-existing fractures and the dynamics of flowback in hydraulic fracturing.

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