Abstract Submitted
for the DFD15 Meeting of
The American Physical Society

Foam-Driven Fractures of an Elastic Matrix CHING-YAO LAI, Department of Mechanical and Aerospace Engineering, Princeton University, SAM SMIDDY , Department of Chemical and Biological Engineering, Princeton University, HOWARD STONE, Department of Mechanical and Aerospace Engineering, Princeton University — We report an experimental study of foam-driven fractures in an elastic matrix. When a pressurized foam is constantly injected into a gelatin matrix with a constant flow rate, the foam generates a disc-like fracture which is commonly observed in liquid-driven fractures. Compare to liquid-driven fractures, foam-driven fractures grow faster with time. We investigate how the rheological behaviour of foams affects the fracture characteristics by varying the air volume fraction of the foam, the types and concentration of surfactants in the foam. Foam-fracturing reduces the environmental costs of hydraulic fracturing, which inspires this laboratory study.

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Date submitted: 01 Aug 2015 Electronic form version 1.4