Abstract Submitted
for the DFD05 Meeting of
The American Physical Society

An experimental model for solid fracture SHEHLA ARIF, Mechanical Engineering, Northwestern University, ADRIAN STAICU, Applied Physics, University of Twente, The Netherlands, SASCHA HILGENFELDT, ESAM and Mechanical Engineering, Northwestern University — A two-dimensional monodisperse dry liquid foam confined in a rectangular-channel Hele-Shaw cell driven by compressed air is used as a model system to study fracture and crack propagation in a solid. As a yield-stress material composed of mm-sized bubbles, the foam allows studies of failure at both the macroscopic (channel) and microscopic (bubble) scales. At smaller driving forces, a finger-like structure evolves emulating quasi-static crack growth. Higher driving forces cause fast rupture of consecutive films, drawing parallels with dynamic crack propagation.

Sascha Hilgenfeldt
ESAM and Mechanical Engineering, Northwestern University

Date submitted: 03 Aug 2005 Electronic form version 1.4