

Abstract Submitted
for the SHOCK07 Meeting of
The American Physical Society

Kinetic Behaviour of Failure Waves in a Filled Glass ANATOLY

RESNYANSKY, Weapons Systems Division, Defence Science and Technology Organisation, NEIL BOURNE, School of Mechanical, Aerospace and Civil Engineering, The University of Manchester, UK — Experimental stress and velocity profiles in a lead filled glass demonstrate a pronounced kinetic behaviour of failure waves in the material during shock loading. The present work summarises the experimental proofs of the kinetic behaviour obtained with stress and velocity gauges. The work describes theoretically this behaviour employing a kinetic model used earlier for a description of fracture waves in pyrex glass. This model is from the family of two-phase strain-rate sensitive models describing behaviour of damaging brittle materials. The modelling results describe well both decay of the failure wave precursor in stress profiles and the velocity attenuation when wave propagating. An influence of the kinetic mechanisms and wave interaction within the test assembly on the reduction of this behaviour is discussed.

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Date submitted: 22 Feb 2007

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