

Abstract Submitted  
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**Hot Spots from Dislocation Pile-up Avalanches** RONALD ARMSTRONG, University of Maryland, WILLIAM GRISE, Morehead State University, HIGH EXPLOSIVES RESEARCH AND DEVELOPMENT COLLABORATION — The model of hot spots developed at dislocation pile-up avalanches has been employed to explain both: greater drop- weight heights being required to initiate chemical decomposition of smaller crystals [1]; and, the susceptibility to shear banding of energetic and reference inert materials, for example, adiabatic shear banding in steel [2]. The evidence for RDX (cyclotrimethylenetrinitramine) is that few dislocations are needed in the pile-ups thus providing justification for assessing dynamic pile-up release on a numerical basis for few dislocation numbers [3]. For release from a viscous obstacle, previous and new computations lead to a local temperature plateau occurring at the origin of pile-up release [4], in line with the physical concept of a hot spot. [1] R.W. Armstrong, C.S. Coffey, V.F. DeVost and W.L. Elban, *J. Appl. Phys.* 68 (1990) 979. [2] R.W. Armstrong and F.J. Zerilli, *Mech. Mater.* 17 (1994) 319. [3] R.W. Armstrong, *Proc. Eighth Intern. Seminar: New Trends in Research of Energetic Materials*, April 19- 21, 2005, Pardubice, CZ. [4] W.R. Grise, NRC/AFOSR Summer Faculty Fellowship Program, AFRL/MNME, Eglin Air Force Base, FL, 2003.

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