Abstract Submitted
for the SHOCK11 Meeting of
The American Physical Society

A comparison of deflagration rates, at elevated pressures and temperatures, with thermal explosion results[1] ELIZABETH GLASCOE, H. KEO SPRINGER, JOSEPH W. TRINGE, JON L. MAIENSCHEIN, Lawrence Livermore National Lab — Previously, the deflagration rate and behavior of HMX-based explosives have been correlated with the violence of thermal explosion experiments. In particular, HMX materials that experience deconsolidative burning at elevated pressures (i.e. P = 200 - 600 MPa) also produce significantly more violent thermal explosions. Recently, we have measured the deflagration rates of HMX-based explosives at elevated temperatures (i.e. T = 150 – 180C) and moderate pressures (i.e. P = 10 – 100 MPa). These conditions more closely mimic the pressure and temperatures of an explosive shortly after ignition of a thermal explosion. We will discuss the deflagration rates of HMX based explosives at elevated temperatures and make comparisons with thermal explosion studies on the same materials.

[1]The Joint DoD-DOE Munitions Technology Development Program is acknowledged for funding. This work performed under the auspices of the U.S. Department of Energy by Lawrence Livermore National Laboratory under Contract DE-AC52-07NA27344.

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Date submitted: 17 Feb 2011 Electronic form version 1.4