Abstract Submitted
for the SHOCK09 Meeting of
The American Physical Society

Isothermal Equations of State of LLM-105 JARED GUMP, CHAD STOLTZ, Indian Head Division, Naval Surface Warfare Center, BENJAMIN FREEDMAN, Naval Research Enterprise Intern Program, SUHITHI PEIRIS, Defense Threat Reduction Agency — 2,6-diamino-3,5-dinitropyrazine-1-oxide (LLM-105) is an energetic ingredient that has an impact sensitivity close to that of TATB, yet a calculated energy content close to HMX. Reported tests of formulated LLM-105 reveal that it is a good candidate for a new insensitive high-performance explosive. As use of LLM-105 increases, thermodynamic parameters and phase stability will need to be determined for accurate modeling. In order to accomplish this goal, isothermal equations of state of LLM-105 at static high pressure and temperature were investigated using synchrotron angle-dispersive x-ray diffraction experiments. The samples were compressed and heated using diamond anvil cells. Pressure - volume data for LLM-105 at ambient temperature and 100°C were fit to the Birch-Murnaghan formalism to obtain isothermal equations of state. Temperature - volume data at ambient pressure were fit to obtain the volume thermal expansion coefficient.

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Date submitted: 13 Feb 2009 Electronic form version 1.4