Abstract Submitted for the SHOCK07 Meeting of The American Physical Society

Modeling of an Implosion Driven Hypervelocity Launcher JA-SON LOISEAU, ANDREW HIGGINS, DANIEL SZIRTI, PATRICK BATCHE-LOR, McGill University, FAN ZHANG, DRDC Suffield, VINCENT TANGUAY, DRDC Valcartier — Modelling work carried out on the implosion driven launcher under concurrent development is presented. The launcher consists of a thin walled metal tube surrounded by explosive which when detonated pinches the tube shut and drives a strong shock into the projectile. The commercial hydrocode LS-DYNA was used to quantitatively and qualitatively evaluate the design parameters of the launcher and their effect on implosion dynamics and performance. These parameters include fill pressure, tube diameter, explosive layer thickness, and explosives tampering. The launcher is primarily modeled using a quasi 2D Arbitrary Langrage Euler formulation. A full 3-D axisymmetric model is also employed. The model is evaluated against experimental data previously collected. Additional developmental work on a second stage launcher taking advantage of a phase velocity between the imploding tube and explosives via the use of angled flyer plates and cones is also carried out.

> Andrew Higgins McGill University

Date submitted: 10 Apr 2007

Electronic form version 1.4