

Abstract Submitted
for the SHOCK05 Meeting of
The American Physical Society

Modeling of bullet penetration in explosively welded composite armor plate VASANT JOSHI, Naval Surface Warfare Center, Indian Head, MD, THEODORE CARNEY, Los Alamos National Laboratories, Los Alamos, NM — Normal impact of high-speed armor piercing bullet on titanium-steel composite has been investigated using smooth particle hydrodynamics (SPH) code. The objective is to understand the effects of multiple hits during the ballistic testing of explosively welded armor plates. These plates have significant micro-structural differences within the weld region, heat-affected zone and the base metal. The variances result in substantial ductility, hardness and strength differences, important criteria in determining the failure mode, specifically whether it occurs at the joint or within the virgin base metal. Several configurations of composite plates with different material combination had to be modeled. The results were used to modify the heat treatment process of explosively welded plates, making them more likely to survive multiple hits.

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Date submitted: 08 Apr 2005

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