

MODELING A ROCKET WARHEAD DETONATION AND FRAGMENTATION USING A 3D NONLINEAR FINITE ELEMENT CODE

G. D. Williams & J. D. Baum

SAIC, 1710 SAIC Dr. MS 2-6-9, McLean, VA 22102, USA

Numerical models provide a safer and often more cost-effective method to evaluate the performance of military warheads and weapons systems, and these simulations are increasingly employed for military research and development. The scientific community must be confident in the accuracy of these computations, and thus analysts need to continually validate numerical models using experimental results. This paper presents results from a numerical model representing a rocket warhead commonly found around the world. The simulation utilizes a three-dimensional nonlinear finite element and fluid dynamics code to characterize the detonation of the high explosive and the mass, velocity, and trajectory of the resulting fragments. These numerical results are compared to data from experimental tests on an identical rocket warhead, and an assessment is provided of the current ability to accurately represent the behavior of the rocket warhead using a numerical approach.