



U.S. ARMY
RDECOM

Weapon-Projectile Mechanics
During Gun Launch

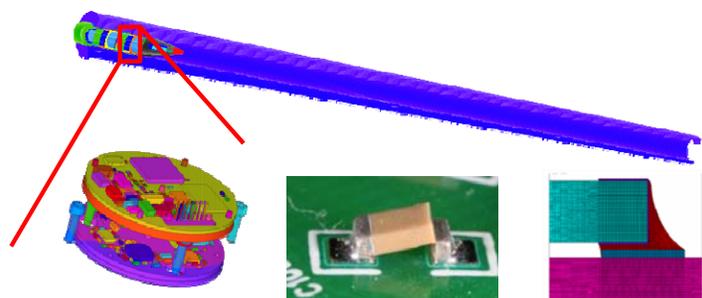


S&T Campaign: Sciences for Lethality & Protection
Ballistics and Blast

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Research Objective

Apply experimental and numerical methods to further the understanding of complex weapon-projectile interactions, their dynamics, and their effect on projectile system during gun launch in order to directly link the interior and exterior ballistics sciences.

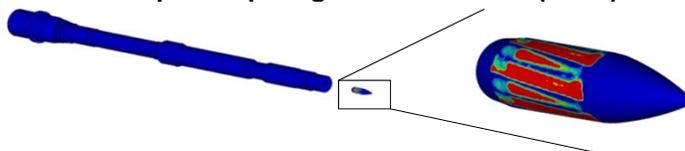


Structural Modeling to Predict Structural Integrity of Electronic Components Subjected to High-G Gun Launch

ARL Facilities and Capabilities Available to Support Collaborative Research

COMPUTATIONAL

ARL DoD Supercomputing Resource Center (DSRC)



Structural Simulation of High-G Gun Launch of Small Caliber Ammunition

EXPERIMENTAL FACILITIES

Small Caliber Indoor Facility
High G Simulation via Air Guns



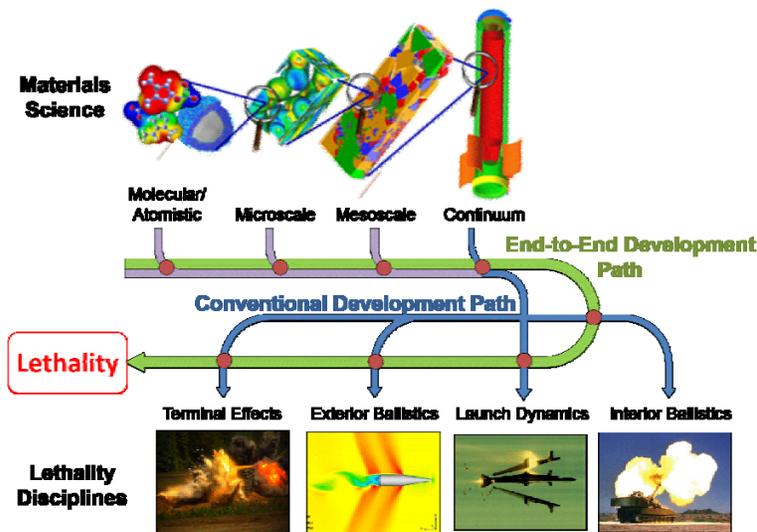
Experimental Setup for Small Caliber Weapon-Projectile Interaction Measurement using Digital Image Correlation

Challenges

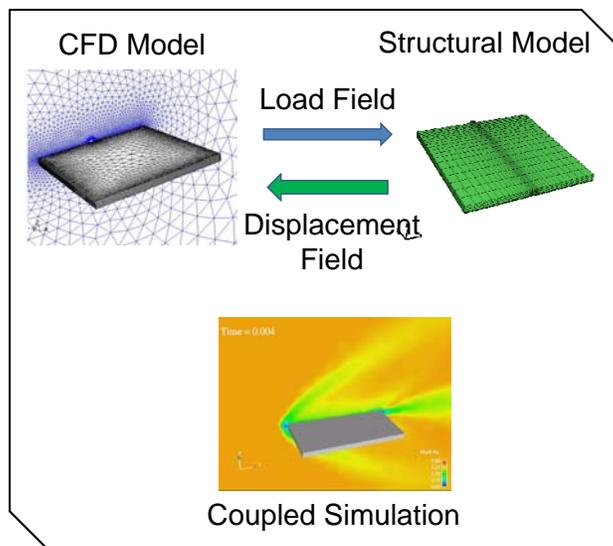
- Multiscale/Multidiscipline Modeling
- Tightly Coupled Multiphysics Modeling
- Constitutive Models for Extreme Environments
- Material Failure Models

Complementary Expertise/Facilities/Capabilities Sought in Collaboration

- Numerical approaches to coupled multiphysics modeling
- Novel methods for multiscale modeling
- Advanced material models for extreme environments



Multiscale and Multidiscipline Approaches to Lethality



Tightly Coupled Multiphysics Modeling