

Diagnostic Development for Ballistic Experiments



S&T Campaign: Sciences for Lethality & Protection

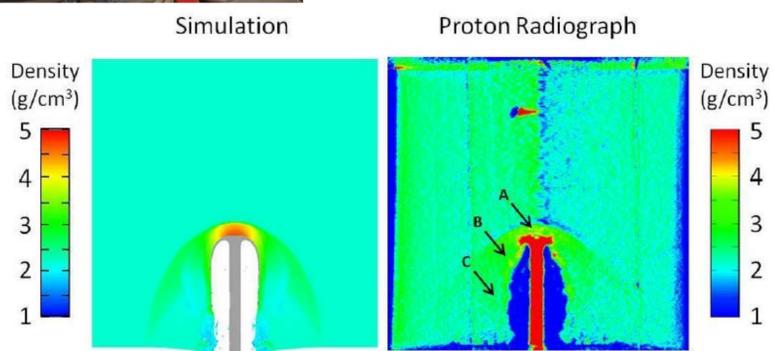
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Research Objective

- Serve as the Department of Defense leader in the field of armor technology
- Develop state-of-the-art diagnostics capable of measuring material response during ballistic events



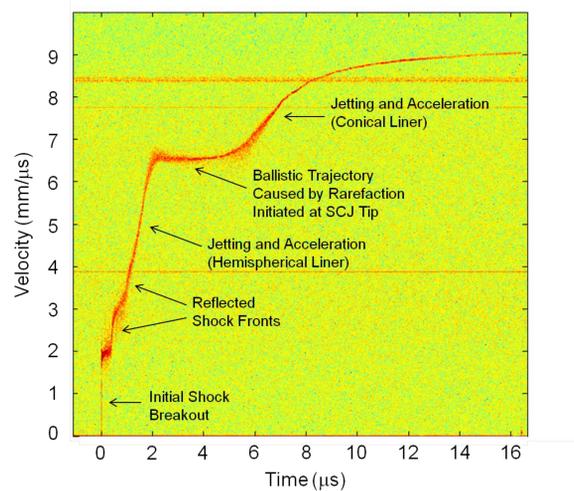
Armor technology to protect the Warfighter



Computational analysis vs. experimental result

ARL Facilities and Capabilities Available to Support Collaborative Research

- Experimental facilities capable of handling up to 20 lb of high explosive
- Computed radiography with flash xray sources from 150 KeV to 1000 KeV
- High speed oscilloscopes up to 16 GHz bandwidth
- High speed video
- Eight channels of 10 GHz Photonic Doppler Velocimetry (PDV)



PDV measurement of shaped charge jet velocity at formation

Challenges

- Increase both the quantity and quality of data typically captured during ballistic experiments
- Explore entirely new diagnostic methods
- Perform these diagnostics in an outdoor environment during explosive events



ARL/APG outdoor experimental facility

Complementary Expertise/ Facilities/ Capabilities Sought in Collaboration

- Expertise and new ideas in flash computed tomography and cineradiography
- New ideas for laser based diagnostics
- Complimentary facility: Advanced Photon Source at Argonne National Laboratory



Complimentary facility: Proton Radiography at Los Alamos National Laboratory