



U.S. ARMY  
**RDECOM**

Modeling Development and Validation Via  
Novel Experimental Diagnostics

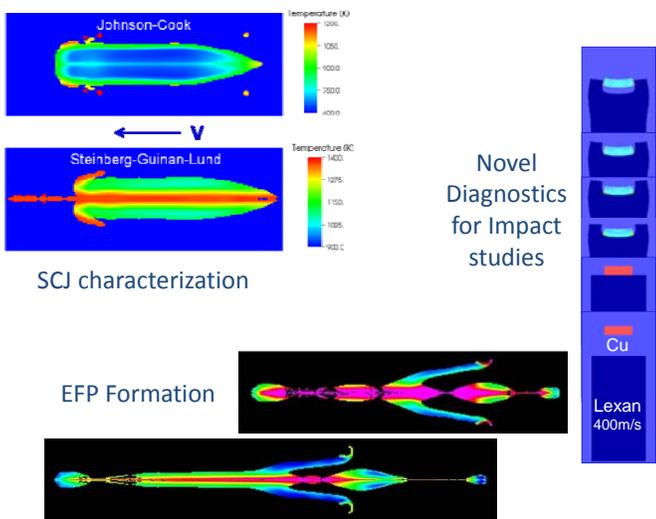


**S&T Campaign: Sciences for Lethality & Protection**  
*Ballistics and Blast*

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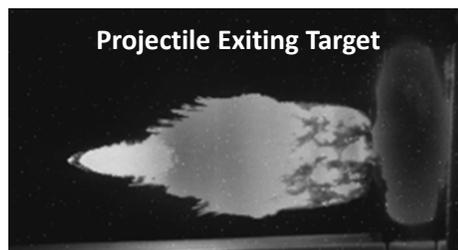
**Research Objective**

- Conduct innovative fundamental research in areas of applied physics essential to state-of-the-art protection technologies.
- Accurately determine in-flight state of matter of various threats and armor materials to support research in electromagnetism and shock physics code validation



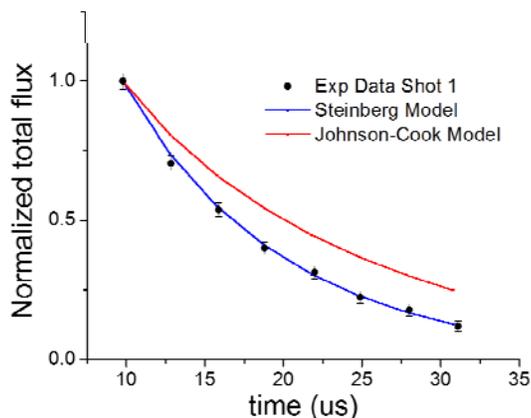
**ARL Facilities and Capabilities Available to Support Collaborative Research**

- Developed novel magnetic diffusion analysis technique and mathematical model for obtaining the temperature and electrical conductivity of threats over a broad dynamic range.
- High speed optical emission spectroscopy
- High speed video, portable flash x-ray, Experimental facilities for high explosives



**Challenges**

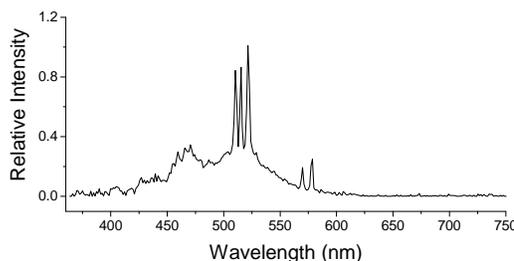
- Enhance, develop, and create state-of-the-art techniques for measurements of material response in extreme environments over large dynamic ranges
- High speed capture of data that enables pushing the envelope of material (threat or target) characterization



Direct Comparison of Shock Physics Code Results to Experimental Data

**Complementary Expertise/ Facilities/ Capabilities Sought in Collaboration**

- Expertise in shock demagnetization and magnetometry
- High flux, long pulse flash x-ray design expertise or capabilities
- Expertise or advancements in x-ray scintillator screen technology



High-speed Spectroscopy of Shock-heated Air Plasma