



US DEPARTMENT OF DEFENSE

BLAST INJURY RESEARCH PROGRAM COORDINATING OFFICE

Blast Exposure Analysis Accelerative Loading Workshop

The Army Research Laboratory (ARL) hosted a workshop on “Numerical Analysis of Human and Surrogate Response to Accelerative Loading” in January 2016. The workshop was co-sponsored by the Warrior Injury Assessment Manikin Engineering Office (WEO) and the Blast Protection for Platforms and Personnel Institute. Approximately 170 attendees, representing nine countries, 14 universities, 13 industrial partners, and numerous organizations throughout the Department of Defense (DoD) and other government agencies, participated in this three-day event. The workshop addressed the numerical analysis tools and methods available to simulate and investigate the response of vehicle occupants to accelerative loading induced from blast events, with an emphasis on under-body blast (UBB). The objectives of the workshop were to explore the scope of current research activities, highlight recent advances in models and techniques, document the capabilities of existing numerical analysis tools, extract knowledge and insights gained from using these tools, and identify technical gaps and numerical tools for critical future needs. The workshop provided a venue for the presentation of science and engineering projects that reflected the latest innovations in state-of-the-art technologies for characterizing and simulating the human response to typical accelerative loading conditions seen in the field. The 36 technical presentations highlighted current capabilities in computational modeling of the human body. Focused discussions addressed the assessment of existing injury criteria; methods for quantifying model validation; scaling techniques for modeling the broad anthropometric spectrum of the Service Member population; and novel imaging techniques for documenting injury. Discussions also helped to identify gaps in the current research, and set short-term goals for continued model development, validation, and application. The Proceedings of the workshop are in review, and will be published in FY17. This workshop provided an opportunity to share the latest innovations in human body modeling with experts from around the world. It also helped to initiate new collaborations in biomechanical modeling and testing to improve ARL’s knowledge of injury mechanisms and thresholds. This knowledge will help advance protective technologies for our Service Members and reduce the incidence of injuries related to blast and ballistic impacts.

