



# Symposium on Interaction of the Effects of Munitions with Structures

## 2019

<b>Blast</b>		
Gran, Jim	Effects Of Elevated Ambient Pressure On Explosive Blast In A Sealed Pipe	
Stewart, Joel	Explosively Driven Shock Tube Investigations	
Trélat, Sophie	Reduced-Scale High Explosive Charges: A Joint Experimental Work To Study Free-Field Blast Effects	
Edri, Idan E.	TNT Equivalency Of Different Explosives In A Confined Space	
Clutter, Keith	Strategy For Modeling Non-Ideal Explosives	
Clutter, Keith	Near-Field Dynamics Affecting Loading From Ideal Explosives	
Ng, Chor Boon	Urban Canyon Explosive Testing To Investigate Effects of Glazing Response And Blast Propagation	
Remennikov, Alex	Performance Characterisation And Further Development With NFPBS' Advanced Blast Simulator	
Langran-Wheeler, Christian	Reflected Blast Loads From Long Cylinders In The Near-Field	
Clutter, Keith	Prediction Of Blast Pressure From Explosions With Aluminum Powder	
Wholey, Will	CFD Investigation Of Blast Pressure Ingress And Interior Distribution In Structures Subjected To External Blast Loading And Development Of Improved Simplified Calculation Parameters For Assessment Of Blast Injury	
Bogosian, David	Consequences Of Applying Objective Methods For Selecting Peak Pressure From Experimental Data	
Josey, Tyson	Advances in Blast Simulator Technology	

<b>Blast, M&amp;S, Load Response, Penetration</b>		
Dalenius, Rolf	Diffraction Effects Of Blast Waves Around Corners	
Klomfass, Arno	A Universal Co-Simulation Interface For Blast-Loading Of Structures	
Astarlioglu, Serdar	Influence Of Load Waveform On Pressure-Impulse Diagrams Of Normal And High-Strength Concrete Panels	
Vankirk, George	The Effects Of Concrete Damage On Projectile Penetration: A Computational Study Using The HRB Model and The Epic Hydrocode	
Josey, Tyson	Further Development and Applications of the PVCGBlast-Source Model	

<b>Protec-Blast</b>		
Jonet, Arnaud	Blast Mitigation Using Mineral Foam As Sacrificial Claddings	
Maazoun, Azer	New Technique To Protect RC Slabs Against Explosions Using CFRP As Externally Bonded Reinforcement	
Eytan, Reuben	Practical Experience In The Optimal Implementation Of "Invisible" Hardening Measures In Buildings	
Ichino, Hiroyoshi	An Experimental Study On Blast Mitigation Layers Composed Of EPS Plate And Soil	
Blanc, Ludovic	Experimental And Numerical Investigation On Load Impulse Reduction With A Sandwich Add-On Armour	
Chee, Min Hui	Reinforced Concrete Panels Retrofitted With Fibre Reinforced Polymers And Subjected To Near-Field Blast And Fragmentation Effects	
Rebelo, Hugo	3D Printed PLA Sacrificial Honeycomb Cladding Blast Mitigation	

Baum, Joseph	Modeling of a Blast Wave Interaction With A Cloud Of Droplets	
Hall, Elise	Optical Diagnostics for Cased Explosive Model Validation and Fragment Measurements	
Mourão, Rodrigo	Experimental Assessment Of Concrete With Bonded FRP Under Contact Explosion	
Dalenius, Rolf	The Influence Of Height Of Charge On Blast Loads Behind A Shielding Wall	
Pezzola, Genevieve	Prototype Testing Of The Expedient Retrofit For Existing Buildings (EREB) System	
Langdon, Genevieve	Influence Of Venting Configuration On The Deformation And Rupture Of A Scaled Aircraft Luggage Container Subjected To Internal Blast Loading	

<b>Protec- Mat Prop</b>		
Esquelin-Mangual, Omar	Experimental Evaluation Of The Impulse Reduction By Plywood And Insulated Foam Panels As Triggering Materials And Implementation On A Fast- Running Tool	
Kilmenko, Jessica	Effect Of Adhesion Level On The Post-Fracture Response Of Laminated Glazing Systems Subjected To Blast Loads	
Li Piani, Tiziano	Dynamic Increase Factors For Adobe: Predicting The Dynamic Strength In Compression For Earthen Materials	
Kai Qi, Tan	Blast Effects On Pavement Sections	
Fryman, Bradon	Hazardous Fragment Distance and Maximum Throw Comparison	
Pereira, Luis	A Numerical Study Of Ballistic Impacts On Normal And High- Performance Concrete	
Magallanes, Joe	High Strain-Rate Behaviors And Modeling Of Structural Steels For Protective Structures	
Davidson, James	Effects Of Masonry-Mortar Bond Strength On The Blast Load Response Of Masonry Walls	
Smith, Zach	Cable Shields – Protecting Bridge Cable from Terrorist Attacks	

<b>MOUT</b>		
Staubs, Ernest	Overview Of Joint Weapon Effects Research	NATO
Rohen, Karl	3D Measurement (As Built Measurement) And Surface Model Of The Entire "Bunker Ladeburg" Complex	NATO
Doerr, Andreas	Experimental Explosive Crater Analysis With Cast	NATO
Ohrt, Alan	Observed Casing Effects From A Heavily-Cased Explosive Cylinder	NATO
Bewick, Bryan	Response Of Adobe Structures Subjected To Internal Blast Loads	NATO
Davis, Roosevelt	Airblast Influences Of Doors In A Multi-Room Structure	NATO
Rossberg, Daniel	Comparison Of Fast Running Simulations With Regard To Blast	NATO
Froechtenicht, Maik	Validation Of Apollo CFD-Code Using Small Scale Tests Of Internal Detonations	NATO
Scarborough, Eric	A Comparison Of Simulating Multiple Fragment Impacts	NATO
Rohen, Karl	Precision 2D Assessment System Of Fragment Holes In Witness Plates	NATO
Minkoff, Sarah	Modeling Complex Structural Environments Using Petra	NATO
Froechtenicht, Maik	Estimating Fragment Scabbing Volumes of a Detonation Room From LIDAR Scans	NATO
Staubs, Ernest	Research Into Secondary Debris And Its Potentially Damaging Effects	NATO

<b>Mout Penetration</b>		
Danielson, Kent	Deformable Fragment And Projectile Penetration Modeling With Resistance Functions	NATO
Greulich, Stefan	Recent Developments In Penetration Methodologies – An Update	NATO
Sauer, Christoph	Modelling The Penetration Into UHPC And FRC – Force Law Development Based On Hydrocode Simulations	NATO
Bongartz, Albrecht	More Joint Effect Testing For Shoulder-Fired Weapons Against Infrastructure Targets	NATO
Bailey, Keri; Sarrach, Thorsten; Bucksch, Martin	US/GE Joint Penetration Experiments Against Advanced Strength Concretes	NATO

<b>Penetration/Combined</b>		
Rouquand, Alain	A Methodology To Simulate Combined Blast And Fragment Effects On Reinforced Concrete Structures	
Agrawal, Ankit	Designing for Combined Effects Of Air-Blast, Fragments, And Fire	
Soto, Orlando	Numerical Modeling Of Fragment And Blast Loaded Concrete Structures Using Massively-Parallel Coupled Cfd-Csd Techniques	

<b>NATO-Blast</b>		
Vorgert, Sarah	Experiments Investigating External Venting Of Internal Detonations in a Small Scale Structure	NATO
Vorgert, Sarah	Experimental Investigation Of Simultaneous Versus Independent Detonations Of Distributed Explosive Charges	NATO
Turton, James	Blast In A Multi-Room Structure	NATO
Petrovitch, Christopher	Blast Propagation Through Rapidly Breached RC Walls	NATO

<b>Shock/SR</b>		
Stone, Michael	An Energy Flow Approach For Assessing NSC And UHPC Cylinders Under Static And Impact Loads	
Edri, Idan	Dynamic Response Characteristics Of Arching Masonry Walls Under Blast Loading	
Schmitt, Daniel	Investigations On Soil Filled Perimeter Walls Under Blast Loading	

<b>Risk Mgmt</b>		
Hagen, Stephen	The Contribution Of Research Products To The Command And Control Process Regarding Structural Protection In Deployed Operations	
Ornai, David	Protective Cable Net Structure Against Drones And Munitions	
Johnsson, Fredrik	Explosive Remnants – A Multifaceted Risk Problem	
Ingier, Petter Toensberg	Stacked Fragmenting Casings	
Turgyan, Scott	Effects of Weaponized Commercial Unmanned Aerial Vehicles (UAVs) on Structures, and Comparison of Analysis Methods	

<b>SHIELD 1</b>		
Knutson, Tor	Shield Management Summary/ Shield Test Execution Summary	NATO
Cavelti, Balz (CHE)	CHE Passive Modular Protection System For Peace Support Missions Exposed To Very Large Air Blast	NATO
Nussbaumer, Peter (CHE)	Whole-Body Displacement Due To Blast Loads	NATO

Nussbaumer, Peter (CHE)	Behaviour Of Swiss Brick Walls Subjected To Blast Loads	NATO
Dirlewanger, Hans (DEU)	Effect Of A Heavy Improvised Explosive Loading On Blast Protection Walls	NATO
Dirlewanger, Hans (DEU)	Effect Of A Super Heavy Improvised Explosive Loading On Wall Systems And Accommodation	NATO
Burbach, Albert (DEU)	Effect Of A Super Heavy Improvised Explosive Loading On Reinforced Concrete Emplacements	NATO
Dalenius, Rolf (SWE)	Impact of Different Charge Configurations	NATO
Johansson, Erik (SWE)	Seismic and Infrasound Measurements at SHIELD	NATO
Persson, Anders (SWE)	Effects of Blast on Anthropometric Test Devices	NATO
Grue, Tormond (NOR)	Triple-layered Laminated Glass Panes Exposed to Blast Loading	NATO
Heggelund, Solveig (NOR)	Global Response Of A Four-Story Concrete Structure Exposed To Blast Loading – Preliminary Results	NATO
Vaughan, Daniel (USA)	SHIELD Free-Field Overpressure Measurements	NATO
Rickman, Denis (USA)	Comparison Of Measured NSKUSTA Pressures On Shield To Small-Scale Results	NATO

<b>SR</b>		
Andrae, Matthias	Explosions Against Full Scale Conventional And Hardened Houses Made Of Masonry, Reinforced Concrete And Steel	
Roller, Christoph	Dynamic Bearing Capacity Of Reinforced Concrete Plates Subjected To Blast Loading,	
Puryear, John	Validation Of A Cold-Formed Steel Stud Wall Finite Element Model Against Blast Test Measurements	
Pope, D.J.	Predicting Near-Field Specific Impulse Distributions Using Machine Learning	

<b>Tool</b>		
Susi, Bryan	Scalable Fidelity CFD Simulations For Decision Support Applications	
Brewer, Tim	Employment Of The Open- Source Airblast Solver Blastfoam To Support The Super Heavy Improvised Explosive Loading Demonstration (SHIELD) Test Program	
Tu, Huan	Damage Prediction Tool Based On Artificial Neural Network Technique For Reinforced Concrete Walls Strengthened With Carbon Fiber Reinforced Polymer Layers Under Close-In Blast Effect	

<b>SR-M&amp;S</b>		
Caçoilo, Andreia	Pressure-Impulse Blast Response Of Steel Iso Containers	
Rakvåg, Knut	Reaction Forces Of Dynamically Loaded Beams	
Luna, Arturo	Determining The Effect Of Weak Horizontal Shear Planes On Composite Flexural Systems Subjected To Blast Loading Using Fundamental Structural Analysis	
Weaver, Mark	Modeling The Residual Capacity Of Blast-Damaged Reinforced Concrete Columns	
Hajek, Radek	Heterogeneous Concrete-Based Bridge Decks Response to Near Field Explosion	

<b>Penetration</b>		
Atoui, Oussama	Numerical Investigation Of High Strength Aluminum Alloy Subjected To High Velocity Impact By A Rigid Spherical Projectile	
Beppu, Masuhiro	A Study On Perforation Failure Of Steel Plates Subjected To Impact	
Remennikov, Alex	An Experimental Investigation Of The Penetration Of Multiple Spaced Hybrid Panels By Explosively Formed Projectiles	
Schwer, Len	The Simulation Of Aluminum- LDPE Barriers For Protection Against Explosively Formed Projectiles	
Sielicki, Piotr	Experimental Study Of Flying Debris Accelerated By Explosive	

<b>Antiterrorism/Blast/Tool</b>		
Swanson, Mark	The Intersection of Antiterrorism and Explosives Safety M&S, Part 1: IMESAFR for Antiterrorism	
Kewaisy, Tarek	Advanced Modeling of High- Velocity Normal Impact of Rigid Projectiles on Reinforced Concrete Slabs	
Berger, Kyle	Software Tool To Predict Injuries From Debris Resulting From Structural Failure	
Oswald, Chuck	An Improved Methodology to Calculate Vented Shock Loads	

<b>Protec-Soil/Tool/Overburden / Mun storage</b>		
Krauthammer, Ted	Refinement of Temporary Munition Storage Using Soil-Filled Walls	
Williams, Neil	Numerical Simulations To Evaluate Effects Of Earth Cover On An ECM	
Durant, Bradley	Determining The Effect Of Soil Cover On The Dynamic Response Of A Concrete Roof Slab Subjected To Blast Loading Using High-Fidelity Simulation	
Payne, Joshua	Evaluation Of Effect Of Earth-Cover Thickness On Ecm Loading: Phase 1 Results	
Schmitt, Daniel	RAFOB-RAM, A Risk Analysis Software Tool For Forward Operating Bases	

<b>NATO- Blast, Protec, Multi Det</b>		
Rios-Estremera, Daniel	Evaluation Of Scaled Range Dependency Of The TNT Equivalence For ANFO	NATO
Stephens, Catherine	Effects Of Charge Shape On Blast Loading And An Empirical Model	NATO
Gomes, Gabriel	Blast Energy-Absorption Connectors In ProtectionOf Infrastructures	NATO
Davis, Roosevelt	Multiple Charge Experiments Against A Surrogate Steel Door In A One Room Structure	NATO
Bogosian, David	Predictive Metrics For Response Of A Hardened Steel Door To Multiple Charges	NATO

<b>SR-Columns/RCCol/UHPC/ Model Approach</b>		
Krauthammer, Theodor	An Energy Flow Based Approach For Structural Response Assessment	
Dua, Alok	Influence Of Axial Load Ratio On The Response Of RC Columns Subjected to Contact Explosion Effects	
Stone, Michael	Normal Strength Concrete And Ultra-High-Performance Concrete Beams Under Impact	

Krauthammer, Theodor	Considerations Of Longitudinal And Shear Reinforcements For UHPFRC Beams	
Zohrabyan, Vahan	Investigations On The Use Of Fibre Concrete For Infrastructure Protection	

<b>NATO-Localized, Protec, Risk Mgmt, Tool</b>		
Bogosian, David	Experimentally-Derived Equivalent Explosive Weights For Non-Ideal Charges	NATO
Huntley, Shelley	Blast Testing Of Modified Shipping Containers Intended For Use As Screening Facilities	NATO
Zohrabyan, Vahan	The Residual Load Bearing Capacity Of Reinforced Concrete As Well As Steel Fiber Reinforced Concrete Components After Contact Detonation	NATO
Sibeaud, Jean-Marc	Model Scale Experiments Of Concrete Slabs Penetration At Supersonic Impact Velocity And Code Validation	NATO