

SIMULATION OF NONIDEAL BLAST WITH SHOCK TUBE EXIT JETSL

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The phenomenon of high dynamic pressure loading at tactical blast overpressure levels induced by the heated precursor region of the nuclear blast has become of great interest due to the increasing proliferation of nuclear arms, and the possibility of those weapons being employed in environments conducive to the production of nonideal nuclear blast. The U.S. Army Research Laboratory (ARL) has been investigating the feasibility of simulating the nonideal blast effect by placing a target a distance beyond the exit of the 1.68m shock tube. It had been demonstrated in an experiment using a full-scale armored personnel carrier (APC) that the shock tube produced sufficient dynamic pressure impulse to displace the APC over 50 m. Further investigations have revealed the exit jet can be modified by attaching a device to spread the exit jet more uniformly over a greater area. The jet spreader, developed on scaled versions of the 1.68m shock tube, was capable of distributing the dynamic pressure impulse over an area four times as great as the unmodified exit jet. Jeep displacement data obtained from several nuclear tests can be compared to jeep displacement experiments conducted at the exit for comparisons of loading and response.