FAST RUNNING MODEL FOR URBAN AIRBLAST USING ENGINEERING PRINCIPLES

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ABSTRACT

This paper presents an improved methodology for calculating airblast pressure waveforms in urban environments, including the effects of shielding and reflections from nearby surfaces. The methodology is applicable to engineers who need a fast prediction of the loading waveforms to estimate damage or injury created by terrorist threat. The model uses an image burst method to capture reflected shocks from nearby surfaces. A fast running search algorithm combined with approximations from SHAMRC calculations capture the effects of shielding and diffraction from obstructing structures.

The methodology includes recent additions that more accurately account for ground reflections through modeling of Mach-stems in both open areas and shielded areas. The paper also presents ongoing work to capture urban canyon effects within the model. Finally, the model was validated using calculated pressure waveforms compared to first principles hydrocode calculations and various small and large scale tests.