

VALIDATION OF OPEN-SOURCE AIRBLAST SOLVER (BLASTFOAM) IN AN URBAN ENVIRONMENT

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Keywords: airblast solver, open-source, validation, urban environment

As discussed in a companion paper by the same authors, *blastFOAM* is a new software tool for modeling the physics of compressible multi-fluid flow in explosive detonations. *blastFOAM* was developed from *OpenFOAM*, an unrestricted, parallel, open-source solver that provides a readily extensible and widely used library, is supported by a large and active community and provides mesh generation and pre/post-processing utilities.

blastFOAM has been validated through comparisons with experimental data from laboratory tests of enclosed detonations and simple field tests with a reflective surface. Recent work has focused on validation for large domains/terrains and for urban settings; this paper presents the latter effort.

A series of large-scale explosive tests were performed in a simulated urban environment at the Energetic Materials Research and Testing Center in Socorro, New Mexico, US, as shown in the figure below. A large number of blast gages were employed and repeated tests with the same scenario were performed to quantify the variability in the data.



As discussed in this paper, *blastFOAM* models were developed and executed and the synthetic and experimental data were compared, for validation. The man-hours required to develop the model and the cpu-hours required to execute the model are reported. An assessment of the ramifications of accuracy of airblast predictions on costs to harden structures and hazards to personnel is also provided.