

A SPECIALIZED FAST FINITE VOLUME AMR SOLVER FOR SIMULATION OF BLAST EVENTS IN URBAN SCENARIOS

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ABSTRACT

For the analysis of the threat by terrorist bombings or weapon effects in urban terrain, fast and easy to use tools to calculate blast propagation and effects are needed. Most existing tools in this category implement simplified models of limited flexibility and/or accuracy. Hydrocodes provide accurate results, however they are complex in application and slow in execution. To overcome this situation we have developed a specialized and fast solver for blast propagation as well as rules for an automated computation setup, which makes the resulting tool easy to use.

The solver is based on an explicit finite volume scheme using a Cartesian grid with automatic mesh refinement. Buildings or other objects are represented in the grid in such a way that both interior and exterior spaces can be considered in a calculation.

This paper presents the methods developed for the solver and computation setup as well as the validation of the tool by comparison to experimental data.