

FLASH: FAST LETHALITY ASSESSMENT FOR STRUCTURES AND HUMANS

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ABSTRACT

CEA is responsible for the coordination of an ongoing cooperation program named “DEMOCRITE”, which received funding from the French National Agency for Research; Technological Development and Demonstration under grant agreement # ANR-13-SECU-0007. The global project aims at providing firefighting services with a software platform dedicated to risk analysis and risk coverage. Among the tools developed during this project, the FLASH code is intended to provide a fast simulation of the consequences of an explosion in urban geometries.

The paper presents the overall structure of the FLASH code, which relies on the widely used “shapefile” geometries (from Geographic Information Systems) for the description of the urban setup. Urban canyon channeling, blast reflections and diffractions are accounted for. The capacities of the FLASH code are illustrated through comparisons with dedicated small-scale experiments as well as available bombing forensics.

The running time of the FLASH code on a standard PC is about 120 seconds for a 500 m x 500 m zone and a grid resolution of 1 m. It drops to less than 20 seconds when a 2 m grid resolution is used.