

Abstract Submitted
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Blast wave mitigation by dry aqueous foam: numerical modelling and experimental investigation. DENIS COUNILH¹, FELIX BALLANGER², NICOLAS RAMBERT³, JEAN-FRANCOIS HAAS⁴, CEA,DAM, DIF 91297 ARPAJON, FRANCE, ASCHWIN CHINNAYYA⁵, INSTITUT PPRIME, ENSMA, 86971 CHASSENEUIL, FRANCE, ALEXANDRE LEFRANCOIS⁶, CEA,DAM, Gramat, 46500 GRAMAT, FRANCE — Dry aqueous foams (two-phase media with water liquid fraction lower than 5%) are known to mitigate blast wave effects induced by an explosion. The CEA has calibrated his numerical multiphase code MOUSSACA from shock tube and high-explosive experiments. The shock tube experiments have highlighted the foam fragmentation into droplets and the momentum transfer between the liquid and gas phases of the foam. More recently, experiments with hemispheric explosive charges from 3 g to 120 g have provided more findings about the pressure and impulse mitigation properties of foams. We have also taken into account the heat and mass transfer, as well as the droplets secondary breakup, characterized by the Weber number, ratio of inertia over surface tension. Good agreement is found between the calculation and the experiments.

¹co-supervisor of the Felix Ballanger 's doctoral thesis

²PhD Student

³laboratory manager

⁴engineer

⁵supervisor of the Felix Ballanger 's doctoral thesis

⁶engineer

Denis Counilh
CEA,DAM, DIF 91297 ARPAJON, FRANCE

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