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Predicting localisation of aluminum particles during the post-detonation phase of high metalized explosives SUAREZ JIMMY, DAM, CEA, Gramat; IMFT, 31400 France, COURTIAUD SBASTIEN, BAUDIN GRARD, DAM, CEA, Gramat, France, POINSOT THIERRY, SELLE LAURENT, IMFT; CNRS; 31400 Toulouse, France, IMFT - MILIEUX REACTIFS TEAM, DAM CEA - CENTRE DE GRAMAT TEAM — In the context of the study of high explosives, the afterburning is defined as the combustion between the detonation products and air. This phenomenon can liberate more energy than the detonation itself and results in an improved blast. When solid metal particles are included into the high explosive, their combustion increases the energy introduced into the flow and strengthens the effects of afterburning. In this paper the dispersion of non-reacting aluminum particles during the post-detonation phase of high explosives will be studied with numerical simulations. The influence of several parameters, such as the particles size or their ability to evaporate, will be assessed. The simulations are made in the frame of Large Eddy Simulation (LES and make use of a " thickened flame " combustion model. Particles are modelled using a lagrangian approach and the drag model of Schiller and Naumann. Results show that, depending on the size of the particles, it is possible to determine if they will be in the combustion zone between detonation products and the air. The analysis of the history of temperature and pressure around particles can indicate if a reacting particle would be likely to evaporate and ignite, thus supplying more energy in the afterburning.

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