

# EXPLOSIVELY DISPERSED PARTICULATES

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Many explosive systems consist of a charge surrounded by a granular material. Examples include an explosively dispersed fuel or explosive surrounded by a mitigating material. A common observation is the formation of finger like structures of the granular material that shed particles in their wake. Our goal is to understand how the detonation processes the surrounding granular material and the method by which the resulting finger structures form.

Dstl have carried out a series of trials with hemispheres of PE4 placed on the ground surrounded by a hemisphere of sand. The mass ratios of sand to explosive range from 5:1 to 45:1. We have used hydrocode modelling to examine the initial stages of the process following detonation. It is suggested that compaction of the surrounding shell leads to the formation of fragments that are much larger than the original particulates of sand. Analysis of the experiments suggests that this processing happens at very early times. Results of the early time simulations are linked to a multiphase model for calculation of the trajectory of the fragments and the formation of finger structures by shedding of material. We use data from these experiments to parameterise a shedding model and report the results of such calculations.