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A Two-Phase Model for Shocked Porous Explosive BRIAN LAMBOURN, CAROLINE HANDLEY, AWE — Mesoscale calculations of hotspots created by a shock wave in a porous explosive show that the hotspots do not cool in times of order at least a microsecond. This suggests that single phase models of porosity like the snowplough model, which assume that a shocked porous explosive jumps to a point on the Hugoniot that is instantaneously in thermodynamic equilibrium, are not correct. A two-phased model of shocked porous explosive has been developed in which a small fraction of the material, representing the hotspots, has a high temperature but the bulk of the material is cooler than the temperature calculated by, for example, the snowplough model. In terms of the mean state of the material, it is shown that the two-phase model only minimally affects the pressure - volume and shock velocity - particle velocity plot of the Hugoniot, but that the mean state lies slightly off the equation of state surface. The results of the model will be compared with two dimensional mesoscale calculations.

Brian Lambourn
AWE

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