

Solution of the Blast Wave Problem in Dusty Gas

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Abstract : The aim of this paper is to find the new exact solution of the blast wave problem in one-dimensional unsteady adiabatic flow for generalized geometry in a compressible, inviscid ideal gas with dust particles. The density of the undisturbed region is assumed to vary according to a power law of the distance from the point of explosion. The exact solution of the problem in form of a power in the distance and the time is obtained. Further, the behaviour of the total energy carried out by the blast wave for planar, cylindrically symmetric and spherically symmetric flow corresponding to different Mach number of the fluid flow in dusty gas is presented. It is observed that the presence of dust particles in the gas yields more complex expression as compared to the ordinary Gasdynamics.

Keywords : shock wave, blast wave, dusty gas, strong shock

Conference Title : ICAFM 2017 : International Conference on Aerodynamics and Fluid Mechanics

Conference Location : Kuala Lumpur, Malaysia

Conference Dates : February 12-13, 2017