THE EFFECT OF PARTICLE SIZE DISTRIBUTION ON THE FLOW FIELD DEVELOPED BEHIND A NORMAL SHOCK WAVE PROPAGATING INTO A DUSTY GAS

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The study of the flow fields which are developed behind shock waves propagating into a dust-gas suspension has become a major area of interest during the past decade. In all the studies which have been reported thus far, the solid particles were taken as „identical“ spheres. By the word identical we mean the same diameter and physical properties (e.g., particle density, heat capacity, etc.).
The above constraint of identical particles was relaxed in the present study, and the following 3 cases have been investigated and solved numerically:

1. the flow field developed behind a normal shock wave propagating into a mixture of gas and solid particles which have a given size distribution function and identical physical properties,

2. the flow field developed behind a normal shock wave propagating into a mixture of gas and solid particles which have uniform size and heat capacity, but a given density distribution function, and

3. the flow field developed behind a normal shock wave propagating into a mixture of gas and solid particles which have uniform size and density, but a given heat capacity distribution.

All the above cases were investigated and the effect of the various distribution functions are described and discussed in detail.