IONIZING BLAST WAVES IN A DUSTY GAS PART 2: A PARAMETRIC STUDY

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The conservation equations appropriate to a steady, one -dimensional flow of dusty ionized argon were solved numerically. The specific effect of each of the physical parameters of the dust upon the flow properties in the relaxation zone was studies. It was found that increasing the dust particle mass causes an increase in both the kinematic and thermal relaxation lengths. In addition to these changes, the flow field inside the relaxation zone is also affected. AN increase in the dust mass (caused either by an increase in the dust density or its diameter) causes an increase in the plasma velocity, and a decrease in its density and pressure.

Similar effects are encountered when the specific heat capacity of the dust is changed. An increase in the emissivity of the dust causes an increase in the plasma density and pressure and a decrease in its velocity,
temperature and electron number density. Increasing the emissivity of the dust results in a decrease in the relaxation zone length.