

Partial Differential Equations

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Abstract

Using implicit and explicit methods, the partial differential equations for the thermal diffusion and one-dimensional hydrodynamic equation are numerically solved. The implicit method increased in accuracy with the increase in N intervals. However, the explicit method for the wave equations proved to be quite sensitive toward the N intervals. The magnitudes of the gas pressure, gas density, and velocity could differ with the change in N intervals. The thermal diffusion equation is solved and plotted for various times and skin depths. The results show a phase lag and decrease in amplitude with increased skin depth. The hydrodynamic equations are solved numerically and plotted to show the behavior of velocity against the other parameters.