NUMERICAL SIMULATION OF THREE-TEMPERATURE GAS DYNAMICS AND THERMAL CONDUCTIVITY IN THE ONE-DIMENSIONAL CASE

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One of the important problems in solving ICF problems is to take into account as many simulated physical processes as possible. One of these processes is the so-called “separation” of temperature, then the temperatures of T_{ion} ions and T_{ele} electrons do not necessarily coincide. The model of gas dynamics, which allows us to take into account the difference in temperatures and energies of ions electrons and photons, will be called a three-temperature model.

The paper presents a one-dimensional system of equations of multi-temperature gas dynamics in an Eulerian description and proposes an algorithm for solving this system. The result of gas dynamic modeling for the case with an ideal gas representation are also presented using the example of a multi-temperature variation of the Soda problem. The closeness of the numerical results by the analytical solution is show. The results of calculations of thermal conductivity problems in the three-temperature case are also given using the example of problems on a traveling heat wave, and the ratio of numerical and analytical solutions is show.