Structural and thermodynamic properties of dense non-isothermal plasma.

T.N. Ismagambetova[1], M.T. Gabdullin[1,2], T.S. Ramazanov[1]

[1]*al-Farabi Kazakh National University, Institute of Experimental and Theoretical Physics (IETP), al-Farabi str., 71, Almaty, 050040, KAZAKHSTAN*
[2]*Kazakh-British Technical University, Tole bi str., 59, Almaty, 050000, KAZAKHSTAN*

In this work, dense non-isothermal plasma was considered. Dense plasma presents a great interest in both theoretical and practical areas of research and is actively studied in laboratory conditions (thermonuclear reactors, gas discharges, etc).

In dense plasmas interparticle interactions play an important role, therefore, the models of interaction between particles have been used to study properties of such plasma. Different potentials [1-2], considering variety of effects such as the screening effects at large distances, the quantum-mechanical effects at small distances like diffraction and symmetry, have been used. The symmetry effect appears only in electron-electron interactions due to Pauli exclusion principle, when influence of different directions of spin of electrons is accounted for. The effects in non-isothermal plasma can also be significantly influenced by the difference between temperatures of electrons and ions [3].

Pair correlation functions obtained on the basis of these interaction potentials were compared with the results of classical mapping and computer simulations [4]. Thermodynamic properties were calculated using pair correlation functions.

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