**STRUCTURAL PROPERTIES OF HYDROGEN PLASMA**

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In this work hydrogen, non-ideal plasma was considered.

Potentials from works by Moldabekov (2012) and Ramazanov (2015), taking into account the quantum-mechanical effects, including Pauli exclusion principle, were used as a model of interaction to study structural properties of hydrogen plasma. The Pauli principle prohibits the simultaneous presence of two identical particles with a half-integer spin (in this case, electrons) in the same state.

Structural properties were calculated using the solution for the integral equation of the Ornstein-Zernike from work by Goodstein (2002):

 (1)

where  is full correlation function,  is direct correlation function.

Pair correlation functions *g(r)* have been obtained in hyper-netted chain approximation on the basis of interaction potentials:

 (2)

where  is the interaction potential.

**References**

Moldabekov, Zh.A., Ramazanov, T.S., Dzhumagulova, K.N. (2012) Pair Interaction Potential of Particles for Two-Component Plasma. Contrib. Plasma Phys*.*, 52 (3), 207–210.

Ramazanov, T.S., Moldabekov, Zh.A., Gabdullin, M.T. (2015). Effective potentials of interactions and thermodynamic properties of a nonideal two-temperature dense plasma. Phys. Rev. E, 92, 023104.

Goodstein, D.L. (2002) States of Matter. Dover publications, Inc., 207-210.

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