

Thermodynamic properties of dense hydrogen plasmas

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In this work we investigated the thermodynamic properties of a dense non-ideal hydrogen plasma on the basis of the effective model of the ion-ion interaction that takes into account the quantum effects of diffraction of ions [1]. Ion-ion radial distribution functions were calculated by solving the Ornstein-Zernike integral equation in the hypernetted-chain (HNC) approximation [2]. Thermodynamic properties (i.e. the correlation energy and the non-ideal component of the equation of state) were obtained through the radial distribution functions and the interparticle interaction potential. The influence of the quantum diffraction effects is greater in denser plasma and at higher values of the coupling parameters.

[1] Ismagambetova T N, Moldabekov Z A, Amirov S M, Ramazanov T S, Gabdullin M T, Temirbek A and Tikhonov A 2020 *Japanese Journal of Applied Physics* **59** SHHA10

[2] Goodstein D L 2002 *States of Matter* (United States: Dover publications, Inc.)