Abstract Submitted
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Density functional theory approach for calculation of dielectric properties of warm dense matter ILNUR SAITOV, Joint Institute for High Temperatures RAS — The reflectivity of shocked xenon was measured in the experiments of Mintsev and Zaporoghets for wavelength 1064 nm [1]. But there is no adequate theoretical explanation of these reflectivity results in the framework of the standard methods of nonideal plasma theory. The assumption of significant width to the shock front gives a good agreement with the experimental data. However, there are no evidences of this effect in the experiment. Reflectivity of shocked compressed xenon plasma is calculated in the framework of the density functional theory approach as in [2]. Dependencies on the frequency of incident radiation and on the plasma density are analyzed. The Fresnel formula for the reflectivity is used. The longitudinal expression in the long wavelength limit is applied for the calculation of the imaginary part of the dielectric function. The real part of the dielectric function is calculated by means of the Kramers-Kronig transformation. The approach for the calculation of plasma frequency is developed [3].

[1] V.B. Mintsev, Yu.B.Zaporogets. Contrib. Plasma Phys. 29, 493 (1989).
[2] M.P. Desjarlais. Contrib. Plasma Phys. 45, 300 (2005).
[3] G.E. Norman, I.M. Saitov, V.V. Stegailov, P.A. Zhilyaev Phys. Rev. E. (2015) (in press.)

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