HIGH-FREQUENCY POTENTIAL WAVES IN PHOTOIONIZED PLASMA

K.Yu. Vagin [1] , T.V. Mamontova [2] , S.A. Uryupin [1,2]

[1] *P.N.Lebedev Physical institute of RAS,*

[2] *National Research Nuclear University MEPhI*

The ionization of substance atoms by intense laser radiation leads to creation of nonequilibrium plasma with anisotropic velocity distribution of photoelectrons. The difference of the photoelectron distribution from the Maxwell distribution results in qualitatively difference ofphotoionized plasmaproperties from those of weakly non-equilibrium plasma.

In this report the new dependencies of dispersion law and damping of high-frequency potential waves on the wave vector in photoionized plasma formed by tunnel ionization of atoms are found. Both cases of plasma formed by linearly and circularly polarized ionizing radiation are considered.It is shown that frequency and damping decrement of the considered waves are strongly anisotropic functions of wave vector. This qualitatively distinguishes high-frequency potential waves in photoionized plasma from their analogue in the Maxwellian plasma-Langmuir waves.For plasma formed by circularly polarized ionizing radiation weakly damped longitudinal waves with a frequency much higher than the electron Langmuir frequency are predicted.