

Effects of Two Cross Focused Intense Laser Beams On THz Generation in Rippled Plasma

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Abstract : Terahertz (THz) generation has been investigated by beating two cosh-Gaussian laser beams of the same amplitude but different wavenumbers and frequencies through rippled collisionless plasma. The ponderomotive force is operative which is induced due to the intensity gradient of the laser beam over the cross-section area of the wavefront. The electrons evacuate towards a low-intensity regime, which modifies the dielectric function of the medium and results in cross focusing of cosh-Gaussian laser beams. The evolution of spot size of laser beams has been studied by solving nonlinear Schrodinger wave equation (NLSE) with variational technique. The laser beams impart oscillations to electrons which are enhanced with ripple density. The nonlinear oscillatory motion of electrons gives rise to a nonlinear current density driving THz radiation. It has been observed that the periodicity of the ripple density helps to enhance the THz radiation.

Keywords : rippled collisionless plasma, cosh-gaussian laser beam, ponderomotive force, variational technique, nonlinear current density

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