

Electron Acceleration by Cross Focused Cosh Gaussian Laser Beams in Thermal Quantum Plasmas

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Theoretical study on electron acceleration by intense laser beams in thermal quantum plasmas has been presented. In order to enhance the interaction of accelerated electrons with the laser beam the irradiance over the beam cross section has been modeled by Cosh Gaussian (ChG) profile. Effect of self focusing of the laser beam on energy gained by the electrons has been investigated in detail. Following moment theory and hydrodynamic fluid model of plasma coupled differential equations governing the evolution of beam width of the laser beam and energy of the accelerated electrons have been obtained. It has been observed that the uniformity of the irradiance over the beam cross section enhances the energy of the accelerated electrons considerably.

Topics

Session B. Laser physics and modern optoelectronics

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