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Investigation of the effect of pulsed lasers and continuous lasers on the inverse bremsstrahlung absorption in laser - fusion plasma

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Inverse bremsstrahlung absorption, (IBA), is the most efficient absorption mechanism in laser-fusion plasma. IBA is the process where an electron absorbs a photon during of colliding to an ion or to another electron. IBA of laser energy in homogeneous and unmagnetized plasma has been studied using the Fokker-Planck equation, f_0 . This equation is an isotropic q -non-extensive electrons distribution function. Considering a circular-polarized laser wave and kinetic theory with the using spherical coordinates we get f_1 that is anisotropic function, then absorption is calculable. A pulsed laser is considered and effect of the physical parameters such as temperature and q (q is a parameter quantifying the degree of nonextensivity) have been studied on the absorption value, then the results are compared with continuous lasers. The calculations of IBA were performed for various q . In this paper we can deduce from calculations, IBA in near of critical layer using continuous lasers is higher than pulsed lasers, also absorption increases with q parameter and it decreases as the temperature increases.

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