

SECOND HARMONIC GENERATION OF Q -GAUSSIAN LASER BEAM IN THERMAL QUANTUM PLASMA

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Second harmonic generation of q -Gaussian laser beam in thermal quantum plasma is investigated in present communication. There is production of transverse gradients of intensity in relativistic plasma due to self-focusing of main beam. These intensity gradients cause electron plasma wave excitation at frequency of main beam. The interaction of excited electron plasma wave with main beam generates 2nd harmonics. Nonlinear differential equation denoting behavior of beam waist of main beam and 2nd harmonics efficiency are derived by using paraxial theory. These equations are numerically solved for investigating impact of usual parameters of laser, plasma along with quantum contribution on beam waist and efficiency of 2nd harmonics. Comparison of current study is also done with cold quantum plasma and classical relativistic plasma cases.

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