

NONLINEAR DYNAMICS OF Q-GAUSSIAN LASER BEAM IN COLLISIONAL PLASMA: EFFECT OF LINEAR ABSORPTION

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The present research investigates nonlinear dynamics of q-Gaussian laser beam in Collisional Plasma considering the influence of linear absorption. In Collisional plasma, redistribution of carriers occurs as a result of non-uniform heating thereby creating density gradients inside plasma leading to beam's self-focusing. The Paraxial ray approximation is used for obtaining the nonlinear differential equation for spot size of laser beam. The numerical solution of this differential equation is obtained by well-known Runge-Kutta 4th order method to explore the behavior of beam waist with normalized propagation distance. Effect of change in laser-plasma parameters such as beam intensity, plasma density, beam radius, absorption coefficient and q-values on beam waist of laser beam is also analyzed.

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