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NONLINEAR SELF-FOCUSING OF COSH-GAUSSIAN LASER BEAM IN RELATIVISTIC PLASMA WITH LINEAR ABSORPTION

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The present study explores nonlinear self-focusing of Cosh–Gaussian (ChG) laser beam in relativistic plasma in presence of linear absorption. The WKB and paraxial theories are used for examining nonlinear evolution of beam spot size by obtaining 2nd order differential equation, which governs variation of beam width with normalized distance. We have incorporated linear absorption in current investigation for considering energy dissipation effects. The resultant equation is numerically solved by Runge-Kutta 4th order method and impact of key laser-plasma quantities like laser intensity, plasma density, absorption factor, decentered parameter and initial beam radius on self-focusing behavior of ChG laser beam is explored. The significant changes in beam dynamics of laser beam have been observed due to these key laser-plasma quantities.

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