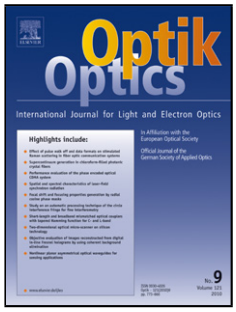

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Effect of *q*-parameter on relativistic self-focusing of *q*-Gaussian laser beam in plasma

B.D. Vhanmore[1], S.D. Patil[2,*], A.T. Valkunde[1], T.U. Urunkar[1], K.M. Gavade[1], M.V. Takale[1], D. N. Gupta[3]

[1]*Department of Physics, Shivaji University, Kolhapur 416 004, India*

[2]*Department of Physics, Devchand College, Arjunnnagar, Kolhapur 591 237, India*

[3]*Department of Physics and Astrophysics, University of Delhi, Delhi 110 007, India*

Abstract

The exponential function in an expression of intensity profile of Gaussian laser beam has been replaced by algebraic function having q exponent in it. In preliminary theoretical investigations, it has been observed that q -Gaussian intensity distribution function plays vital role in the dynamics of laser beam propagating in relativistic plasma. In present theoretical investigation, the usual parabolic equation approach under paraxial and WKB approximations has been adopted, taking into account relativistic nonlinearity. We have established the nonlinear differential equation for the beam-width parameter f and solved it numerically by using fourth order Runge-Kutta method. The effect of q parameter on the variation of beam width parameter f with normalized distance of propagation ξ has been presented graphically and discussed.

Keywords: q -Gaussian, relativistic, self-focusing, plasma

*Corresponding author.

E-mail: sdpatil_phy@rediffmail.com (S.D. Patil)