

## ANALYTICAL STUDY OF HChG-LASER BEAM PROPAGATION IN COLLISIONAL AND COLLISIONLESS PLASMAS

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*We have studied the propagation of  $m=0, 1$  and  $2$  mode Hermite-cosh-Gaussian (HChG) laser beams in collisional and collisionless plasmas. The field distribution in the medium is expressed in terms of beam-width parameter  $f$  and decentred parameter  $b$ . The differential equations for  $f$ -parameter are established by parabolic wave equation approach under paraxial approximation. Analytical solutions are obtained under the condition  $R_n < R_d$  where,  $R_n$  is the self-focusing length and  $R_d$  is the diffraction length. The behaviour of  $f$ -parameter with the dimensionless distance of propagation  $\eta$  for various  $b$ -values is examined by numerical estimates. The results are presented graphically.*

*Keywords : Hermite-cosh-Gaussian (HChG) beam, Plasma, Parabolic wave equation, Paraxial approximation, Self-focusing/defocusing.*