

STATIC MAGNETIC FIELD INFLUENCE ON PONDEROMOTIVE SELF FOCUSING OF LASER BEAM THROUGH PLASMA

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ABSTRACT

The nonlinear dielectric constant of magnetized plasma due to its nonlinear interaction with high intense laser beam is derived. Operating the ponderomotive force, the influence of both longitudinal and transverse external magnetic fields on laser beam self-focusing inside collisionless plasma have been calculated. The results show a well enhancement in beam self-focusing when both longitudinal and transverse magnetic fields are increased. Furthermore, in presence of longitudinal magnetic field, the self-focusing of laser beam is greater in comparing with transverse magnetic field.

KEYWORDS: Ponderomotive Nonlinearity, Self-focusing, Longitudinal and Transverse Magnetic Field