PREFACE

The nonlinear interaction of Hermite-cosh-Gaussian laser beam and cosh-Gaussian laser beam with the plasmas and clusters is studied. In this work, we apply plasma density ramp and the affects of density transition on self-focusing are investigated. Self-focusing ability of an energetic beam in the nonlinear medium is widely studied by researchers and scientists as the converged beam have lot of energy focused at a point. It is very well known that a small convex lens (due to nonlinearity) can focuses the sun light at a point and this energy is sufficient to burn a piece of paper. In the present study an energetic beam gets focused as it propagates deeper into the nonlinear medium and one may have the idea of amount of energy generated in this process. In many socially useful applications like laser driven accelerators, scribing type of applications in electronics, the generation of inertial fusion energy driven by lasers, generation of x-rays etc., high energy is required and hence, self-focusing effect is very useful in these cases. We have focused our attention on enhancing self-focusing effect by the proper selection of various parameters of laser-plasma/cluster interaction. The enhancement in self-focusing of laser beam has been observed and reported in the present study.

I am highly thankful to Dr. Niti Kant for valuable guidance to complete this work. I am highly thankful to my wife and family for their co-operative attitude during the entire period of this work.

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