

## Stimulated Raman Scattering of Ultra Intense Hollow Gaussian Beam

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**Abstract :** Effect of relativistic nonlinearity on stimulated Raman scattering of the propagating laser beam carrying null intensity in center (hollow Gaussian beam) by excited plasma wave are studied in a collisionless plasma. The construction of the equations is done employing the fluid theory which is developed with partial differential equation and Maxwell's equations. The analysis is done using eikonal method. The phenomenon of Stimulated Raman scattering is shown along with the excitation of seed plasma wave. The power of plasma wave and back reflectivity is observed for higher order of hollow Gaussian beam. Back reflectivity is studied numerically for various orders of HGLB with different value of plasma density, laser power and beam radius. Numerical analysis shows that these parameters play vital role on reflectivity characteristics.

**Keywords :** Hollow Gaussian beam, relativistic nonlinearity, plasma physics, Raman scattering

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