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Stimulated Backward Raman scattering in a Magnetized Density Rippled Plasma

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Stimulated Backward Raman Scattering (SBRS) of a laser may be suppressed by the existence of magnetic field and density rippled plasma is shown in this study. The density perturbation caused by the lower hybrid wave combines with the pump wave's oscillatory velocity to create a nonlinear current that drives the sideband. Analytically, the effects of different modes on the growth rate showed that the growth rate of SBRS is reduced significantly due to the ripple and local effects. While for radial eigen mode number of $(p = 3)$ and azimuthal mode number $l = 2$ the growth rate is maximum and the magnetized density ripple has a strong localization effect on the Raman process. The growth rate of SBRS increases with magnetic field, peaks at some optimal value, and then falls. The scattering procedure has a magnetized density rippled signatures which could act as a diagnosis.

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