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Stimulated Brillouin Scattering of q-Gaussian Laser Beams in Underdense Plasmas: Effect of Self Focusing

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This paper presents theoretical study of phenomenon of stimulated Brillouin scattering of q-Gaussian laser beams in nonlinearly-interacting with underdense plasmas. During propagation of intense laser beam with ω0, it gets coupled to pre-existing ion acoustic wave (IAW) at frequency ωia due to relativistic mass nonlinearity of plasma electrons. The nonlinear interaction of pump beam with IAW produces a back scattered wave at frequency ωs = ω0- ωia. Semi analytical solution of the set of coupled wave equations (pump, IAW and scattered wave) has been obtained under W.K.B. approximation by using variational theory. It has been observed that power of scattered wave is significantly affected by self focusing of pump beam.

Topics

Session B. Laser physics and modern optoelectronics

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