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Stimulated Raman backscatter in the kinetic regime of lasers with orbital angular momentum[1] SARAH CHASE, BENJAMIN WINJUM, FRANK TSUNG, KYLE MILLER, University of California, Los Angeles, DENISE HINKEL, Lawrence Livermore National Laboratory, WARREN MORI, University of California, Los Angeles — In the field of the nonlinear optics of plasmas, stimulated Raman scattering (SRS) has been actively investigated owing to its deleterious consequences for laser driven inertial confinement fusion (ICF). There has been little research on SRS for general Laguerre Gaussian laser modes which are characterized by radial and azimuthal mode numbers (p and l) and can have orbital angular momentum (OAM). SRS involving lasers with OAM has an l number matching condition in addition to the frequency and wave-number matching conditions. A given laser can scatter into a variety of different l (and p) modes and the resulting plasma waves can also carry OAM. The helical shape of a phase front of a wave with OAM changes the particle trapping dynamics. We present preliminary results of SRS of Laguerre Gaussian modes using the UPIC and OSIRIS particle-in-cell codes. We use electrostatic and Darwin PIC codes to isolate the evolution of driven plasma waves and the quasi-3D version of OSIRIS to study SRS of a single Laguerre Gaussian speckle for plasma conditions of interest to ICF.

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