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Nonlinear Fluid Simulation Study of Stimulated Raman and Brillouin Scatterings in Shock Ignition[1] CHUANG REN, Univ of Rochester, LIANG HAO, IAPCM, Beijing, China, RUI YAN, USTC, Hefei, China, JUN LI, UCSD, WENDA LIU, Univ of Rochester — We developed a new nonlinear fluid laser-plasma-instability code *FLAME* using a multi-fluid plasma model combined with full electromagnetic wave equations. The completed one-dimensional (1D) version of *FLAME* was used to study laser-plasma instabilities in shock ignition. The simulations results showed that absolute Stimulated Raman Scattering (SRS) modes growing near the quarter-critical surface were saturated by Langmuir-wave Decay Instabilities (LDI) and pump depletion. The ion-acoustic waves from LDI acted as seeds of Stimulated Brillouin Scattering (SBS), which displayed a bursting pattern and caused strong pump depletion. Re-scattering of SRS was also observed in a high temperature case. These results largely agreed with corresponding Particle-in-Cell simulations.

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