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Modeling Hot-Electron Measurements in Multibeam Two-Plasmon–Decay Experiments R.K. FOLLETT, D.H. EDGELL, R.J. HENCHEN, S.X. HU, J. KATZ, D.T. MICHEL, J.F. MYATT, J.G. SHAW, A.A. SOLODOV, B. YAAKOBI, D.H. FROULA, Laboratory for Laser Energetics, U. of Rochester — Many-beam laser facilities introduce laser–plasma interactions where multiple beams can couple to common daughter waves. Recent theory, modeling, and experiments have suggested that multiple laser beams can drive the two-plasmon–decay (TPD) instability through common electron plasma waves. Experiments and modeling suggest that these waves lead to turbulence and the acceleration of electrons to high energies. Experiments on OMEGA used ultraviolet Thomson scattering to observe TPD-driven electron plasma waves and hard x-ray detectors to infer the corresponding hot-electron production. The experiments were modeled in 3-D using a hybrid code (*LPSE*) that combines a pseudospectral wave solver for calculating the bulk fluid behavior with a particle tracker for calculating nonlinear Landau damping. Detailed comparison of both the hot-electron generation and the turbulent electron plasma wave spectrum are in excellent agreement with the experimental measurements. This material is based upon work supported by the Department of Energy National Nuclear Security Administration under Award Number DE-NA0001944.

R.K. Follett
Laboratory for Laser Energetics, U. of Rochester

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