Collisional Effects on Hot-Electron Generation in Two-Plasmon-Decay Instability in Inertial Confinement Fusion

J. LI, R. YAN, C. REN, A.V. MAXIMOV, Laboratory for Laser Energetics, U. of Rochester, W.B. MORI, F.S. TSUNG, U. of California, Los Angeles — Recent particle-in-cell (PIC) and fluid simulations for the study of the collisional effects on hot-electron generation in two-plasmon-decay (TPD) instability in the regime relevant to experiments on the OMEGA Laser System are presented. The collision package in the PIC code OSIRIS has been benchmarked and shown to produce proper electron–ion collision rates in PIC simulations. Collisions have been found to significantly reduce TPD hot-electron generation. This reduction is partially caused by collisional suppression of the non-linear TPD modes away from the quarter-critical surface that were found to form the first stage of hot-electron acceleration.¹ This work was supported by the U.S. Department of Energy under Cooperative Agreement Nos. DE-FG02-06ER54879 and DE-FC52-08NA28302, by NSF PHY-0903797, and by NSFC 11129503.