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Mitigating Two-Plasmon-Decay Hot-Electron Generation Through the Modification of Langmuir and Ion-Acoustic Wave Dissipation in Directly Driven Targets J.F. MYATT, J. ZHANG, V.N. GONCHAROV, A.V. MAXIMOV, R.W. SHORT, Laboratory for Laser Energetics, U. of Rochester, D.F. DUBOIS, LANL and Lodestar Research Corp., D.A. RUSSELL, Lodestar Research Corp., H.X. VU, U. of California, San Diego — The deleterious effects of two-plasmon-decay (TPD) instability (mainly preheat caused by hot-electron generation) can be mitigated by reducing the TPD growth rate through an increase in Langmuir wave (LW) collisional damping and by encouraging nonlinear saturation at low LW amplitudes. Both processes are investigated using a quasilinear-Zakharov model of TPD. It is shown that the lowest level of nonlinear saturation is achieved for mid-Z materials with weak ion-acoustic wave (IAW) damping. Possible explanations for these results are presented including a reduction in the threshold for the Langmuir decay instability, more-favorable nucleation of LW's in density cavities, and easier ponderomotive excitation of IAW turbulence. This work was supported by the U.S. Department of Energy Office of Inertial Confinement Fusion under Cooperative Agreement No. DE-FC52-08NA28302.

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