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The Effect of Cross-Beam Energy Transfer on Two-Plasmon Decay in Direct-Drive Implosions D.H. FROULA, R.K. FOLLETT, R.J. HENCHEN, A.K. DAVIS, V.N. GONCHAROV, D.H. EDGELL, A.A. SOLODOV, D.T. MICHEL, J.F. MYATT, J.G. SHAW, C. STOECKL, Laboratory for Laser Energetics, U. of Rochester — Mitigation of cross-beam energy transfer (CBET) in direct-drive implosions was shown to increase the hot electrons generated by two-plasmon decay. Reducing the diameter of the laser spots by 30% significantly reduces CBET and the laser absorption was measured to increase from 75% to nearly 90%.[1] The reduced CBET leads to higher intensity at the quarter-critical density surface, increasing the hot-electron production by a factor of ~ 7. Adding a thin layer (0.6 to 1.1 μm) of Si to the target ablator reduced the hot-electron fraction by a factor of ~ 2. Spatially resolved Thomson-scattering measurements show an $\sim 15\%$ increase in the electron temperature and an increase in the Si fraction at the quarter-critical surface when the Si layer is added. Three-dimensional laser–plasma interaction simulations of hot-electron production using the code *LPSE* show that in addition to the reduced gain (smaller $IL_{\mathrm{n}}/T_{\mathrm{e}}$), the observed reduction in hot electrons results from increased electron–ion collision frequencies and reduced Landau damping of ion-acoustic waves.[2] This material is based upon work supported by the Department of Energy National Nuclear Security Administration under Award Number DE-NA0001944.

[1]D. H. Froula *et al.*, Phys. Rev. Lett. **108**, 125003 (2012).
[2]R. K. Follett *et al.*, Phys. Rev. Lett. **116**, 155002 (2016).

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