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Two-Plasmon-Decay Preheat Calculations for OMEGA and Ignition-Scale Direct-Drive Inertial Confinement Fusion J.F. MYATT, J.A. DELETTREZ, W. SEKA, D.H. EDGELL, A.V. MAXIMOV, R.W. SHORT, Laboratory for Laser Energetics, U. of Rochester, D.F. DUBOIS, LANL, D.A. RUSSELL, Lodestar Research Corp., H.X. VU, U. of California, San Diego — Two-plasmon-decay instability is potentially a source of hot electrons and preheat in both direct- and indirect-drive ICF targets. A model of nonlinear saturation of TPD is developed that relies on two-dimensional extended Zakharov calculations.[1] Hot-electron generation is computed in the saturated state by a test-particle approach and recirculation (an important effect caused by the low ρR at the time of instability) is modeled by a particular form of boundary conditions on the test particles.[2] Hot-electron temperature and preheat scalings are presented as a function of density scale length and laser intensity for parameters relevant to OMEGA and the NIF. This work was supported by the U.S. Department of Energy Office of Inertial Confinement Fusion under Cooperative Agreement No. DE-FC52-08NA28302.

[1]D. A. Russell and D. F. DuBois, Phys. Rev. Lett. **86**, 428 (2001).
[2]J. F. Myatt *et al.*, "The Predicted Dynamics of Hot Electron Heating and Recirculation in Direct-Drive Implosion Experiments," in preparation, Phys. Plasmas.

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