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Modeling of Two-Plasmon–Decay Experiments at Polar-Direct-Drive Ignition-Relevant Plasma Conditions at the National Ignition Facility A.A. SOLODOV, M.J. ROSENBERG, J.F. MYATT, R. EPSTEIN, S.P. REGAN, W. SEKA, J.G. SHAW, M. HOHENBERGER, Laboratory for Laser Energetics, U. of Rochester, J.D. MOODY, J.E. RALPH, D.P. TURNBULL, LLNL — The two-plasmon–decay (TPD) instability can be detrimental for direct-drive inertial confinement fusion because of target preheat by high-energy electrons generated by TPD. The radiation–hydrodynamic code *DRACO* has been used to design planar target experiments that generate plasma and interaction conditions relevant to ignition polar-direct-drive (PDD) designs. The use of planar targets allows TPD to be decoupled from cross-beam energy transfer, which reduces the laser absorption in current National Ignition Facility (NIF) PDD implosion experiments. The laser–plasma interaction code *LPSE* has been used to investigate TPD using the predicted plasma profiles and laser irradiation geometry in three dimensions. The energetic electrons generated by *LPSE* are propagated into the planar target using the Monte Carlo transport code *EGSnrc*. This enables a direct comparison between the simulated and experimentally observed Mo K_α fluorescence and hard x-ray bremsstrahlung. The plasma profiles have been post-processed for stimulated Raman and Brillouin backscatter gains. Comparisons of these results with recent experiments at the NIF and the implications for ignition-scale PDD experiments will be presented. This material is based upon work supported by the Department of Energy National Nuclear Security Administration under Award Number DE-NA0001944.

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