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Two-Plasmon Decay: Simulations and Experiments on the NIKE Laser System¹ LEE PHILLIPS, J.L. WEAVER, J. OH, A.J. SCHMITT, S. OBENSCHAIN, D. COLOMBANT, Naval Research Laboratory — NIKE is a KrF laser system at the Naval Research Laboratory used to explore hydrodynamic stability, equation of state, and other issues arising in the research toward inertial fusion energy. The relatively small KrF wavelength, according to widely used theories, raises the threshold of most parametric instabilities. We report on simulations performed using the FAST3d radiation hydrocode to design TPD experiments. By post-processing the results of the simulations we have designed experiments that have explored the use of simple threshold formulas (from developing theories) and help establish the soundness of our simulational approach. Turning to the targets proposed for ICF energy research, we have found that among the designs for the proposed Fusion Test Facility (Obenschain et al., Phys. Plasmas 13 056320 (2006)), are some that are below LPI thresholds. We have also studied high-gain KrF shock ignition designs and found that they are below LPI thresholds for most of the implosion, becoming susceptible to TPD only late in the pulse.

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