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pF3d simulations of nonlinear laser propagation in a multi-speckle environment¹ E.S. DODD, B. BEZZERIDES, D.F. DUBOIS, H.X. VU, LANL — Current design practice focuses on estimating LPI growth with linear analysis and using the average laser intensity [1]. However, LPI growth can be dominated by nonlinear effects, and by the distribution of intensities from the multi-speckle nature of the beam. Recent work on stimulated Raman scattering (SRS) has shown that above a threshold, due to trapped electrons, the reflectivity is greatly increased [2,3]. This threshold also has a dependence on local plasma conditions that differs from the SRS growth rate. In this poster we discuss current work that attempts to understand how the onset of nonlinear Langmuir wave behavior is affected by inter-speckle interactions with the pF3d code [4]. The current work shows that the distribution function for speckle intensities must be taken into account and that the average intensity currently used is insufficient. [1] R. Berger, E. A. Williams, and A. Simon, *Phys. Fluids B* 1 414 (1989). [2] H. X. Vu, D. F. DuBois, and B. Bezzerides, *Phys. Plasmas* 9 1745 (2002). [3] H. X. Vu, D. F. DuBois, and B. Bezzerides, *Phys. Plasmas* 14 012702 (2007). [4] R. L. Berger, C. H. Still, E. A. Williams, and A. B. Langdon, *Phys Plasmas* 5 4337 (1998).

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