Abstract Submitted
for the DPP06 Meeting of
The American Physical Society

Langmuir wave damping decreases slowly HARVEY ROSE, Los Alamos National Laboratory — The onset of stimulated Raman scatter in a single laser speckle occurs (D. S. Montgomery *et al.*, Phys. Plasmas, **9**, 2311 (2002)) at lower laser intensity, I, than predicted by linear theory based on classical Landau damping, $\nu_{\rm L}$, of the SRS daughter Langmuir wave. Does this imply that SRS onset in a speckled laser beam, propagating through long scale length plasma, is also at odds with linear theory? It has been shown (Harvey A. Rose and D. F. DuBois, Phys. Rev. Lett. **72**, 2883 (1994)) that linear convective gain in speckles with large fluctuations of I about the average, $\langle I\rangle$, leads to onset at a value of $\langle I\rangle$, $I_{\rm c}$, small compared to that for onset in a uniform beam. While nonlinear electron trapping effects may occur in very intense speckles, whether or not these effects are sufficient to lower the onset value of $\langle I\rangle$ below $I_{\rm c}$ depends on how strongly electrons must be trapped before there is significant reduction in $\nu_{\rm L}$. As the amplitude of an SRS daughter Langmuir wave increases, its $\nu_{\rm L}$ decreases by the factor $\nu/\omega_{\rm b}$, due to the competition between electron trapping, with electron bounce frequency, $\omega_{\rm b}$, and escape of these trapped electrons by advection out of a speckle's side, at rate ν. This result (Harvey A. Rose and David A. Russell, Phys. Plasmas, **8**, 4784 (2001)) is valid for $\nu/\omega_{\rm b} \ll 1$. In this talk I present a nonlinear, transit time damping, calculation of $\nu_{\rm L}$ and find that reduction by a factor of two does not occur until $\omega_{\rm b}/\nu \approx 5$. This slow turn on of trapping effects suggests that the linear calculation of $I_{\rm c}$ is NIF relevant.

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Date submitted: 13 Jul 2006 Electronic form version 1.4