Abstract Submitted
for the DPP07 Meeting of
The American Physical Society

Collective stimulated Brillouin backscatter PAVEL LUSHNIKOV, Department of Mathematics and Statistics, University of New Mexico, HARVEY ROSE, LANL — We develop the statistical theory of linear collective stimulated Brillouin backscatter (CBSBS) in spatially and temporally incoherent laser beam. Instability is collective because it does not depend on the dynamics of isolated hot spots (speckles) of laser intensity, but rather depends on averaged laser beam intensity, optic f/#, and laser coherence time, T_c. CBSBS has a much larger threshold than a classical coherent beam's in long-scale-length high temperature plasma. It is a novel regime in which T_c is too large for applicability of well-known statistical theories (RPA) but T_c must be small enough to suppress single speckle processes such as self-focusing. Even if laser T_c is too large for *a priori* applicability of our theory, collective forward SBS[1], perhaps enhanced by high Z dopant, and its resultant self-induced T_c reduction, may regain the CBSBS regime. We identified convective and absolute CBSBS regimes. The threshold of convective instability is inside the typical parameter region of NIF designs. Well above incoherent threshold, the coherent instability growth rate is recovered. [1] P.M. Lushnikov and H.A. Rose, Plasma Physics and Controlled Fusion, 48, 1501 (2006).

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Date submitted: 16 Jul 2007 Electronic form version 1.4