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Collective stimulated Brillouin scatter[1] PAVEL LUSHNIKOV, ALEXANDER KOROTKEVICH, University of New Mexico, HARVEY ROSE, Los Alamos National Laboratory and New Mexico Consortium — We develop a statistical theory of stimulated Brillouin backscatter (BSBS) of a spatially and temporally partially incoherent laser beam for laser fusion relevant plasma. We find a new collective regime of BSBS which has a much larger threshold than the classical threshold of a coherent beam in long-scale-length laser fusion plasma. We identify two contributions to BSBS convective instability increment. The first is collective with intensity threshold independent of the laser correlation time and controlled by diffraction. The second is independent of diffraction, it grows with increase of the correlation time and does not have an intensity threshold. The instability threshold is inside the typical parameter region of National Ignition Facility. We also find that the bandwidth of KrF-laser-based fusion systems would be large enough to allow additional suppression of BSBS.

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Pavel Lushnikov
University of New Mexico

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