Abstract Submitted
for the DPP15 Meeting of
The American Physical Society

Controlling Laser-Plasma Instabilities and CBET Using STUD Pulses in the Strong Coupling Regime for Direct and Indirect Drive ICF
BEDROS AFEYAN, Polymath Research Inc., N. MEEZAN, S. MACLAREN, J. HAMMER, LLNL, D. MONTGOMERY, LANL, J. HEEBNER, LLNL — We will show theoretical results on the behavior of SBS in the strong damping regime and CBET in mid-Z plasmas (around 20) where ion Landau damping and collisional damping are both higher order effects and strong coupling is dominant in laser hot spots and near Mach -1 surfaces in appropriately tuned pairs of crossing beams. The spatially dependent frequency shits that ensue and the reductions in growth rate allow the control of LPI even downstream beyond the crossing volumes. Multiple successive crossings between O(100) beams can be used to change the space-time intensity distributions of lasers used entirely differently in direct and indirect drive geometries. In the former case, due to the existence of many angles, a statistical Sqrt(N) gain is expected. with randomly phased beams via STUD pulses. On the other hand, for indirect drive, with 2-4 cone angles to contend with, turning off interactions by staggering crossing beam spikes, achieved with STUD pulses, is a key deterministic element for the success of the plan. Changing the speckle statistics at will and with fine control is a grand challenge of this set of techniques.

Bedros Afeyan
Polymath Research Inc.

Date submitted: 12 Jul 2015 Electronic form version 1.4