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STUD Pulse performance comparisons between weak and strong damping limits of SBS[1] STEFAN HULLER, Centre de Physique Theorique, CNRS, Ecole Polytechnique, France, BEDROS AFEYAN, Polymath Research Inc., Pleasanton, CA — The physical mechanisms that make STUD pulses (spike trains of uneven duration and delay) optimal rely, among other physical effects, on damping of the driven waves in between spikes. By varying the damping of ion acoustic waves in inhomogeneously flowing plasma regions ranging from -8 to -2 of the Mach number, we can establish to what extent STUD pulses can be effective to control SBS growth in various damping levels. By changing the duty cycle of the chain of spikes, by changing their modulation period, by adding random inter spike phase kicks and by changing the spatial hot spot profile scrambling rate, we establish bounds on how much Brillouin backscattering Rosenbluth gain can be tolerated at the average intensity and still have STUD pulses control SBS as compared to RPP or SSD or ISI. The situation is complicated by the implication of the strong coupling regime in hot spots, by pump depletion and by initial noise level dependencies which we also examine.

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Bedros Afeyan
Polymath Research Inc., Pleasanton, CA

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