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Optical Mixing in the Strong Coupling Regime: A New Method of Beam Conditioning at Hohlraum LEH and Direct Drive ICF Coronal Plasmas[1] MARINE MARDIRIAN, BEDROS AFEYAN, Polymath Research Inc., Pleasanton, CA, STEFAN HULLER, Centre de Physique Theorique, CNRS, Ecole Polytechnique, France, DAVID MONTGOMERY, P-24, Los Alamos National Laboratory, DUSTIN FROULA, Laboratory for Laser Energetics, University of Rochester, ROBERT KIRKWOOD, Lawrence Livermore National Laboratory — We will present theoretical and computational results on Brillouin interactions between two beams in co-, counter-, and orthogonal propagation geometries. The beams will be structured (with speckle patterns), the plasma will have inhomogeneous flow including the Mach -1 surface. As the growth rate of the instability surpasses the natural frequency of the ion wave, the strong coupling regime (SCR) is reached, where reactive quasi-modes with intensity dependent frequency shifts result. This is especially true in laser hot spots. We trace the consequences of operations in this regime with different damping rates on the ion acoustic waves. We consider convective and absolute instabilities as well as the design of experiments which could examine these new regimes of instability behavior with new 10 psec time resolved diagnostics. Whether well enough conditioned beams can result after 10's or 100's of pairwise crossings in direct and indirect drive ICF configurations, and whether SRS can thus be strongly suppressed downstream, remains to be demonstrated. But the prospects exist for such new paths to instability control in a staged manner before STUD pulses are implemented.-

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