Abstract Submitted
for the DPP05 Meeting of
The American Physical Society

Beam Conditioning Mitigation of Laser Plasma Instabilities at the National Ignition Facility B. LANGDON, E. WILLIAMS, D. HINKEL, S. DIXIT, R. KIRKWOOD, D. MUNRO[1], Lawrence Livermore National Laboratory — Several beam conditioning measures are planned for the National Ignition Facility. These include phase plates, smoothing by spectral dispersion (SSD), polarization smoothing (PS), and a color shift between inner and outer beam cones ("two color"). The latter reduces inter-cone power transfer in the plasma flowing out of the entrance hole in indirection drive ignition targets by introducing a frequency mismatch between the beam cones. We present simulation studies and analysis of the interaction of SSD and power transfer for beams smoothed by phase plates. In part, SSD effectively broadens the sonic resonances, eroding the mismatch, and we predict also that SSD also can introduce an oscillation in the power transfer at the modulator frequency of 17 GHz. However, a flexible span of "two color" wavelength shift minimizes power transfer. We also present analysis of effects of SSD on beam spray due to forward Brillouin scatter near the threshold for filamentation.

[1]Work performed under the auspices of the U.S. Department of Energy by the Lawrence Livermore National Laboratory under Contract No. W-7405-ENG-48

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Date submitted: 22 Jul 2005 Electronic form version 1.4