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Three-Dimensional Evaluation of Laser Imprint in National Ignition Facility Multi-FM Smoothing by Spectral Dispersion Experiments A. SHVYDKY, M. HOHENBERGER, P.B. RADHA, M.J. ROSENBERG, K.S. ANDERSON, V.N. GONCHAROV, J.A. MAROZAS, F.J. MARSHALL, P.W. MCKENTY, S.P. REGAN, T.C. SANGSTER, Laboratory for Laser Energetics, U. of Rochester, J.M. KONING, M.M. MARINAK, L. MASSE, LLNL — Control of shell nonuniformities imprinted by a laser and amplified by hydrodynamic instabilities in an imploding target is critical for the success of direct-drive ignition at the National Ignition Facility (NIF). One-dimensional, multi-FM smoothing by spectral dispersion (SSD), proposed to provide the required level of smoothing of the laser imprint, has been integrated into one quad of the NIF Laser System and used in recent experiments. The experiments employed flat CH foils driven with a single NIF quad with either the multi-FM or stimulated Brillouin scattering suppression SSD. Face-on x-ray radiography was used to measure optical-depth variations, from which the amplitudes of the foil areal-density modulations were obtained. Results of 3-D, radiation–hydrodynamics code *HYDRA*[1] simulations of the growth of the imprint seeded perturbations are presented and compared with the experimental data. The effectiveness of the multi-FM SSD in reducing the imprint is evaluated. This material is based upon work supported by the Department of Energy National Nuclear Security Administration under Award Number DE-NA0001944.

[1]M. M. Marinak *et al.*, Phys. Plasmas **8**, 2275 (2001).

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