Abstract Submitted
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Study of astrophysical collisionless shocks at NIF[1] HYE-SOOK PARK, D. P. HIGGINSON, C. M. HUNTINGTON, B. B. POLLOCK, B. A. REMINGTON, H. RINDERKNECHT, J. S. ROSS, D. D. RYUTOV, G. F. SWADLING, S. C. WILKS, LLNL, Y. SAKAWA, Osaka Univ, A. SPITKOVSKY, Princeton Univ, R. PETRASSO, C. K. LI, MIT, A. B. ZYLSTRA, LANL, D. LAMB, P. TZEFERACOS, Univ Chicago, G. GREGORI, J. MEINECKE, Oxford, M. MANUEL, Michigan, D. FROULA, LLE, F. FIUZA, SLAC — High Mach number astrophysical plasmas can create collisionless shocks via plasma instabilities and turbulence that are responsible for magnetic field generations and cosmic ray acceleration. Recently, many laboratory experiments were successful to observe the Weibel instabilities and self-generated magnetic fields using high-power lasers that generated interpenetrating plasma flows [1,2]. In order to create a fully formed shock, a series of NIF experiments have begun. The characteristics of flow interaction have been diagnosed by the neutrons and protons generated via beam-beam deuteron interactions, the x-ray emission from the hot plasmas and proton probe generated by imploding DHe3 capsules. This paper will present the latest results from the NIF collisionless shock experiments. [1] C. M. Huntington, et al., Nature Physics, 11, 173 (2015); [2] W. Fox, et al., Phys. Rev. Lett., 111, 225002 (12013).

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