HIGH FOOT IMPLOSION EXPERIMENTS IN RUGBY HOHLRAUMS

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The rugby hohlraum designs present a significant shape change compared to cylindrical hohlraums designed for indirect drive inertial confinement fusion at the National Ignition Facility (NIF) [1]. The rugby hohlraum design is aimed at providing uniform x-ray drive on the capsule while minimizing the need for crossed beam energy transfer (CBET)[2]. Experiments using the high foot, high adiabat laser pulses have produced record neutron yields from DT layered implosions using high gas fill cylindrical hohlraums. However the yields may now be limited by loss of drive efficiency due to time-dependent drive symmetry swings as a by-product of applying substantial crossed beam energy transfer from outer cone beams to inner beams to keep the final implosion near round. As part of a series of experiments at the NIF using the same high foot setup but with rugby hohlraums, design improvements in dual axis shock tuning experiments produced some of the most symmetric shocks measured on implosion experiments at the NIF. Furthermore, with rugby hohlraums, we have demonstrated similar hohlraum temperature, x-ray flux and capsule velocity to those of cylindrical hohlraums. These results were achieved with lower levels of hot electrons that can preheat the DT fuel layer for increased adiabat and reduced areal density. Detailed results from these experiments and those planned throughout the summer will be presented and compared with results obtained from cylindrical hohlraums.

[1] Amendt, P., Ross J. S., Milovich J.L., *et al*., PoP 21, 112703 (2014).
[2] Michel P., Glenzer S. H., Divol L., et el., PoP 17, 056305 (2010)
[3] Hurricane, O. A et al. NATURE Volume: 506 Issue: 7488 Pages: 343