

Abstract Submitted
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Spiral wobbling beam illumination uniformity in Heavy Ion Fusion¹ S. KAWATA, T. KUROSAKI, S. KOSEKI, Y. HISATOMI, D. BARADA, Utsunomiya Univ., Japan, A.I. OGOYSKI, Varna Tech. Univ., Bulgaria, B.G. LOGAN, J. BARNARD, HIF-VNL, LBNL, U.S.A. — A new beam illumination scheme has been found, in which a few per cent beam illumination nonuniformity is realized for a spiraling and “wobbling” beam in a heavy ion inertial confinement fusion (HIF) driver. The oscillating- HIB (heavy ion beam) energy deposition may produce a time-dependent implosion acceleration, which reduces both the Rayleigh-Taylor (R-T) growth [NIMA 606, 152(2009)] and the implosion nonuniformity. Three-dimensional HIB illumination computations indicate that the few per cent spiral-wobbling HIB illumination nonuniformity oscillates with the same wobbling HIB frequency. In HIF, HIB axes can be controlled precisely with a high frequency (100MHz \sim 1GHz) centroid oscillation about the axis. This oscillating HIB creates a small oscillating energy deposition in time and space. This small oscillating nonuniformity can produce a small oscillating implosion acceleration nonuniformity. When the oscillation frequency is comparable to or larger than the R-T growth rate, it reduces the R-T growth significantly.

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