

Abstract Submitted
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Nonuniformity Mitigation of Beam Illumination in Heavy Ion Inertial Fusion¹ SHIGEO KAWATA, K. NOGUCHI, T. SUZUKI, T. KUROSAKI, D. BARADA, Y.Y. MA, Utsunomiya University, A.I. OGOYSKI, Varna Technical University — In heavy ion inertial fusion wobbling heavy ion beam (HIB) illumination was proposed to realize a uniform implosion. The wobbling HIB axis oscillation is precisely controlled. The oscillating frequency may be several 100MHz \sim 1GHz. In the wobbling HIBs illumination, the illumination nonuniformity oscillates in time and space on a HIF target. The oscillating-HIB energy deposition may contribute to the reduction of the HIBs' illumination nonuniformity. Three-dimensional HIBs illumination computations presented here show that the few percent wobbling HIBs illumination nonuniformity oscillates with the same wobbling HIBs frequency. In general a perturbation of physical quantity would feature the instability onset. Normally the perturbation phase is unknown so that the instability growth is discussed with the growth rate. However, if the perturbation phase is known, the instability growth can be controlled by a superposition of perturbations; the well-known mechanism is a feedback control to compensate the displacement of physical quantity. If the perturbation is induced by, for example, a HIB axis wobbling, the perturbation phase could be controlled and the instability growth is mitigated by the superposition of the growing perturbations.

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