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Impacts of Implosion Asymmetry And Hot Spot Shape On Ignition Capsules[1] BAOLIAN CHENG, THOMAS J.T. KWAN, YI-MING WANG, S. AUSTIN YI, STEVE BATHA, Los Alamos National Laboratory — Implosion symmetry plays a critical role in achieving high areal density and internal energy at stagnation during hot spot formation in ICF capsules. Asymmetry causes hot spot irregularity and stagnation de-synchronization that results in lower temperatures and areal densities of the hot fuel. These degradations significantly affect the alpha heating process in the DT fuel as well as on the thermonuclear performance of the capsules. In this work, we explore the physical factors determining the shape of the hot spot late in the implosion and the effects of shape on -particle transport. We extend our ignition theory [1-4] to include the hot spot shape and quantify the effects of the implosion asymmetry on both the ignition criterion and capsule performance. We validate our theory with the NIF existing experimental data Our theory shows that the ignition criterion becomes more restrictive with the deformation of the hot spot. Through comparison with the NIF data, we demonstrate that the shape effects on the capsules performance become more explicit as the self-heating and yield of the capsules increases. The degradation of the thermonuclear burn by the hot spot shape for high yield shots to date can be as high as 20

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