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Tracking the movement of the ICF hot spot using the time variance of the shape measured with gated x-ray cameras at NIF SHAHAB KHAN, BRIAN SPEARS, ARTHUR PAK, LAURA BENEDETTI, TAMMY MA, NOBUHIKO IZUMI, LUC PETERSON, OGGIE JONES, RICHARD TOWN, DAVE BRADLEY, Lawrence Livermore National Laboratory — The requirements for a successful Inertial Confinement Fusion (ICF) implosion include an efficient coupling of the drive to the inward implosion of the capsule as well as a near symmetric convergence of the capsule during and after the drive. In order to maximize coupling efficiency, the drive should be such as to minimize the translation of the capsule's center of mass during the implosion. This study will focus on the methods utilized to measure capsule movement. The National Ignition Facility (NIF) employs gated x-ray framing cameras to capture snapshots of the x-ray hot spot or backlit images of the shell during implosion. Ideally, the movement of the capsule would be measured by the position of the image on the detector. However, this does not give accurate results because the registration of the pinholes to the detector is not known and the distance between the pinholes are irregular. An indirect method is to track the center of nested contours of the images as a function of time. An assessment of these methods on several shots, including one with an imposed asymmetric drive, is presented.

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