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A Kirkpatrick-Baez Microscope for Core Implosion Imaging at NIF LOUISA PICKWORTH, DAVID BRADLEY, TOMMASO PARDINI, VLADIMIR SMALYUK, NOBUHIKO IZUMI, MICHAEL PIVOVAROFF, JULIA VOGEL, CHRISTOPHER WALTON, PAUL MIRKARIMI, PERRY BELL, TODD DECKER, THOMAS MCCARVILLE, MARION AYERS, LLNL, JOSEPH KILKENNY, GA — ICF experiments have typical core diameters raging from $50\mu m$, in layered implosions, to $100\mu m$ in SymCaps. The emission spectrum is peaked between 8 and 10keV. Current X-ray imaging at NIF uses time resolved pinhole cameras with 10-20μm pinholes that limit resolution and throughput to the detector. Selection of observed photon energy requires filtering that further reduces transmission. Low resolution, in combination with poor signal to noise ratio, limits the observable features during the later stages of capsule implosion. Using grazing incidence mirrors in a Kirkpatrick-Baez (KB) configuration, a focusing x-ray microscope is in design for NIF. The system will have x12 magnification, detector limited resolution and x10 higher throughput in comparison to pinhole systems. A KB microscope for imaging ICF experiments will be described, utilizing multilayer mirrors to enhance reflectivity for the core emission. Optimization of the multilayer coating allows observation of extended sources and high reflectivity in a selected energy band $>$ 0.2keV. Prepared by LLNL under Contract DE-AC52-07NA27344. LLNL-ABS-640864

Louisa Pickworth
LLNL

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