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10.19 Multi-frame radiography using the Crystal Backlighter Imager coupled to a new Single Line of Sight camera on the National Ignition Facility

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The Crystal Backlighter Imager (CBI) is a monochromatic x-ray radiography diagnostic developed with the goal of imaging the late stages of inertial confinement fusion implosions on the NIF. Initially, CBI could only provide a single radiograph per crystal x-ray optic per experiment given the use of a microchannel plate camera as the detector. The Single-Line-of-Sight (SLOS) framing camera is a transformative diagnostic that records a sequence (2-4) of fast-gated (100-35ps) x-ray images along the same line of sight. CBI has recently been coupled to SLOS, which increased the data output to multiple radiographs from a single crystal x-ray optic per NIF shot. Results will be presented from several experiments used to commission the coupling of CBI to SLOS. Spatial resolution as a function of backlighter standoff was measured by radiographing test objects. Timing calibration was achieved by comparing SLOS radiographs to one from the microchannel plate camera, whose timing was known to high accuracy, on two nominally-identical capsule implosions shots. Lawrence Livermore National Laboratory is operated by Lawrence Livermore National Security, LLC, for the U.S. Department of Energy, National Nuclear Security Administration under Contract DE-AC52-07NA27344. Release # LLNL-ABS-744383.

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