

Abstract Submitted
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Calibrating Curved Crystals Used for Plasma Spectroscopy¹

MICHAEL HAUGH, KEN JACOBY, PATRICK ROSS, National Security Technologies, GREG ROCHAU, MING WU, Sandia National Laboratory, SEAN REGAN, Laboratory for Laser Energetics, MARIA BARRIOS, Lawrence Livermore National Laboratory — Curved crystals are used as diffraction elements for X-ray spectrometers in diagnosing laser plasma sources at the National Ignition Facility at Lawrence Livermore National Laboratory and on the Z machine at Sandia National Laboratories. Reflectivity curves for various curved crystals used at these facilities have been measured in National Security Technologies' (NSTec) X-ray laboratory. The X-ray source is a diode arrangement with a dual goniometer system that orients a monochromator and the sample crystal to the appropriate Bragg angles. The reflectivity curve is then measured at energies that ranged from 0.7 to 15.8 keV. This presentation covers reflectivity curve measurements on circular cylindrical KAP crystals and elliptical cylindrical PET crystals. The integrated reflectivity, the curve width, and the peak reflectivity were determined. The integrated reflectivity and the width of curved crystals were much larger than the values for the corresponding flat crystal, increasing as the radius of curvature decreases for a given photon energy. For a fixed radius of curvature, they increase as the photon energy increases.

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