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6.21 Development of a New Reflectometry Endstation for Crystal Calibrations using Synchrotron Light Sources

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A new reflectometry endstation has been developed specifically for the utilization of synchrotron radiation–based light sources. This paper describes the experimental setup and associated capabilities designed to measure crystal diffractive properties for a wide range of crystals, cut orientations, and surface geometries, including flat, convex, concave, and imaging arrangements. We are now adapting the system to render it suitable for use on the new NNSA soft x-ray calibration beam line (SXR) located at Stanford Synchrotron Radiation Light Source. This beam line (16-2) is expected to come online later in 2018. The endstation setup is unique in that it also accommodates large reflection angles (>80°). The system has been prototyped and successfully commissioned at Lawrence Berkeley National Laboratory's Advanced Light Source beam line 9.3.1. Data from various calibration studies of flat quartz (100) and potassium acid phthalate (KAP), cylindrically bent KAP ranging in radius of curvature from 2 to 9 inches, spherically bent quartz (203), 220Ge and 335Ge, and tronconique-bent CsAP (cesium biphthalate) are discussed. This work was done by MSTS, LLC, Contractor for the NNSS, under Contract DE-NA-0003624 and by SNL under contract DE-NA-0003525. DOE/NV/0003624--0025.

Primary author(s) :   STOLTE, Wayne (Nevada National Security Site)

Co-author(s) :   WU, Ming (Sandia National Laboratories); WEBER, Franz (Nevada National Security Site); MOY, Ken (Nevada National Security Site); KRUSCHWITZ, Chris (Nevada National Security Site); LAKE, Pat (Sandia National Laboratories); BOURDON, Chris (Sandia National Laboratories)

Presenter(s) :   STOLTE, Wayne (Nevada National Security Site); WU, Ming (Sandia National Laboratories); WEBER, Franz (Nevada National Security Site); MOY, Ken (Nevada National Security Site); KRUSCHWITZ, Chris (Nevada National Security Site); LAKE, Pat (Sandia National Laboratories); BOURDON, Chris (Sandia National Laboratories)

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