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Grazing incidence surface scattering in the Pb/Si(111) system using an Area Detector M.W. GRAMLICH, S.T. HAYDEN, YIYAO CHEN, P.F. MICELI, U. of Missouri — Geometrical effects are considered when using an area detector for in situ x-ray grazing incidence scattering studies of the Pb/Si(111) system. Rod-like scattering and 3D-crystallite diffraction can both occur during in situ studies and these require different geometrical considerations. The Pb/Si(111) system conveniently exhibits different surface phases that provide useful examples, including randomly oriented 3D-crystallites on the surface that form powder diffraction rings. The shape of a diffraction ring depends on the position of the detector in real space. For rod scattering, the length of the image on the detector depends on resolution as well as domain size. We will discuss methods for obtaining reciprocal space information from area detector images in surface diffraction. Research funding is supported by NSF DMR-0706278. The experiments were performed at the Advanced Photon Source Sector 6 beam-line at Argonne National Laboratory, which is supported by the US-DOE through Ames Lab under Contract No. W-7405-Eng-82.

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