

Abstract Submitted
for the MAR14 Meeting of
The American Physical Society

Lensless imaging of atomic surface structures using ptychography in reflection mode CHENHUI ZHU, ROSS HARDER, Argonne National Lab, ANA DIAZ, Paul Scherrer Institut, Switzerland, VLADIR KOMANICKY, Safarik University, Slovakia, ANDI BARBOUR, RUQING XU, Argonne National Lab, XIAOJING HUANG, Brookhaven National Lab, YAOHUA LIU, Argonne National Lab, MICHAEL PIERCE, Rochester Institute of Technology, HOYDOO YOU, Argonne National Lab — We propose that atomic structures on single crystal surfaces can be imaged using a variation of coherent x-ray diffractive imaging. This is a lensless ptychographic technique applied along the crystal truncation rod in reciprocal space. Simulations show that the highest sensitivity on the monolayer surface structure is obtained at the anti-Bragg condition. We demonstrate the feasibility of ptychographic reconstruction from experimental data collected in reflection mode by reconstruction of atomic steps on a crystal surface. This work and use of the Advanced Photon Source and the Electron Microscopy Center for Materials Research were supported by the U.S. Department of Energy, Office of Basic Energy Sciences, under Contract No. DE-AC02-06CH11357. The work at Safarik University is supported by Slovak grant VEGA 1/0782/12 and ERDF EU grant under contract No. ITMS 26220120005

Chenhui Zhu
Argonne National Lab

Date submitted: 09 Nov 2013

Electronic form version 1.4