

Abstract Submitted  
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**Dynamical diffraction effects on beam focusing for x-ray back reflection from curved multi-plate x-ray crystal cavity** YING-YI CHANG, SUNG-YU CHEN, Department of Physics, National Tsing Hua University, MAU-TSU TANG, National Synchrotron Radiation Research Center, M. YABASHI, Spring-8/RIKEN Mikazuki, Hyogo, Japan, YI-WEI TSAI, YU-HSIN WU, SHIH-CHANG WENG, CHIA-HUNG CHU, PO-YU LIAO, Department of Physics, National Tsing Hua University, SHIH-LIN CHANG, National Synchrotron Radiation Research Center — We have recently observed diffraction enhanced beam-focusing in curved multi-plate x-ray crystal cavities of silicon using (12 4 0) as the back reflection at 14.4388 keV. The measurement on the transmitted x-ray beam size through the crystal cavities shows a reduced focal length and an extremely long beam waist at the focal point. This effect could be understood according to the dynamical theory of x-ray diffraction. Based on the consideration of the excitation of the dispersion surface for each curved crystal surface involved in the crystal device, beam focusing and beam splitting occur, leading to the observed focusing feature. Detailed dynamical calculations on the transmitted intensities at different positions near the focal point will be discussed.

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