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Nanofocusing of hard x-rays with profile coated elliptical mirrors¹

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The ability to focus hard x-rays by means of mirrors has progressed recently to the achievement of focus sizes well below 100 nm.[1] At the Advanced Photon Source at Argonne National Laboratory elliptical mirrors have been made by means of profile coating. [2] In this technology a highly precise elliptically shaped surface is achieved by magnetron sputtering of Au onto a flat silicon substrate. Results will be presented to detail the rapid progress being made in this technology. Also, results for wave optical simulations will be summarized. [3]. X-ray mirrors are achromatic focusing optics, and a nanofocused beam is expected to have many uses for experiments in condensed matter physics. [1] W. Liu, G. Ice, J. Tischler, A. Khounsary, C. Liu, L. Assoufid, A. Macrander, Rev. Sci. Instrum. 76, 113701(2005). [2] C. Liu, L. Assoufid, R. Conley, A. Macrander, G. Ice, J. Tischler, Opt. Eng. 42, 3622 (2003). [3] C. Kewish, L. Assoufid, A. Macrander, j. Qian, Appl. Opt. , in press .

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