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X-ray Young's double slit experiment and other aspects of kinoform X-ray prism arrays[1] A.F. ISAKOVIC, K. EVANS-LUTTERODT, BNL-NSLS, A. STEIN, J.B. WARREN, BNL-CFN, S. NARAYANAN, A.R. SANDY, ANL-APS — Numerical design and large aspect ratio nanofabrication techniques [1] were employed to produce kinoform prisms and lenses for the purpose of focusing, deflecting and characterizing hard X-ray synchrotron radiation. Purely refractive lenses are hampered by the effects of absorbtion, which limits the numerical aperture of the lens and hence the optic resolution. Kinoform lenses allow one to circumvent these limitations, with the trade-off of an energy bandwidth for the optic. Purely refractive prisms have similar limitations due to absorption, and consequently we choose to fabricate kinoform prisms and study their properties experimentally and theoretically. In particular we analyze theoretically the extent to which the kinoform prism can be modeled by a simple prism, and the effect of nanofabrication precision on the prism performance. The focus of the nanofabrication efforts is in balancing out patterning of a large area and a deep anisotropic etch. Experimental characterization is performed at APS 8-ID beamline. We observed, controlled and measured interference fringes, in analogy with the Young's double slit experiment. [1] A. F. Isakovic *et al.*, JVST-A **26**, 1182 (2008) and J. Synchr. Rad. **16**.

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