Near-diffraction Limited Coherent X-ray Focusing using Planar Refractive Lenses made in Epoxy Resist SU8


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We present results on optical properties of high resolution planar refractive lenses studied with hard X-ray coherent radiation. Large aperture (up to 1mm) and high aspect ratio planar parabolic lenses were manufactured in epoxy type SU8 resist using deep synchrotron lithography. Resolution of about 250 nm was measured for the Su8 lens consisting of 62 individual lenses at 14 keV in a distance of 58 m from the source. In-line holography of B-fibber was realized in imaging and projection mode with a magnification of 3 and 20 respectively. Submicron features of the fiber were clearly resolved. Coherent properties of the set-up allow to resolve near-focus fine structure in scanning and imaging mode with lens defocusing. This fine structure is determined by the tiny aberrations caused by lens imperfections close to the parabola apex.