SSRF XIL beamline BL08U1-B introduction

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The Soft X-ray interference lithography beamline (XIL) BL08U1-B is one of the Shanghai Synchrotron Radiation Facility (SSRF) beam lines, it started preliminary design at the beginning of 2004, the project starts from April 2009 to December 2011, and it is open to the customer since January 2013.

Soft-X ray interference lithography (XIL) is a newly developed technique for production of periodic nano-structures with resolution below 100 nm. The technique is based on coherent radiation obtained from undulators at synchrotron radiation (85-150 eV). Because of its small wavelength (typical value: 13.4 nm) and practical absence of the proximity effect, high density resolution lines/dots with high density can be afforded. The throughput of this parallel exposing method is much higher than that of the serial electron-beam lithography. Interference schemes based on diffraction (gratings) optics have been constructed at BL08U1-B beamline in SSRF. Both one-dimensional and two-dimensional patterns such as arrays of dots have been achieved.

XIL technology finds use in a variety of fields. Below are just some examples of common uses: photonic Crystals for Light Extraction from LEDs; high sensitivity gas detector; the template for self-assembly, nanoimprint and cell growth; novel EUV photo resist test;. calibration samples for SEM, SFM, STM, TEM microscopes.

Up to now, XIL beam line can provide user with at least 100nm period 1D or 2D periodic photo resist nanostructures. According to the request of the user, we can also transfer these photo resist pattern to other films such as dielectric and metal.