

Surface analysis using coherent x-ray diffraction

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We will demonstrate that coherent x-ray diffraction (CXD) can be used to study surface morphology in the reflectivity mode. This geometry is very forgiving of the longitudinal coherence of the source, and so raw undulator radiation can be used without the need of a monochromator. In this way, sensitivity to morphological features down to about 10 Angstroms in size can be achieved with reasonable signal levels. We will show CXD data for silicon surfaces as a function of chemical treatment with HF acid and observe interesting time dependence after the treatment. We demonstrate also a relatively simple mathematical model that can be used to understand the CXD patterns that result.