SURFACE MORPHOLOGY BY REFLECTIVITY OF COHERENT X-RAYS

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Coherent X-ray Diffraction (CXD) is a new technique made possible by the enhanced brilliance specifications of hard x©ray undulators at third-generation synchrotron radiation sources. CXD differs from conventional diffraction in that it uses a microscopic beam that is close to fully coherent. The resulting diffraction pattern is related to the Fourier transform of the entire object illuminated by the beam, and hence is sensitive to any fluctuations within it, whether these are in space or in time. We have observed CXD effects in the near©specular reflectivity from silicon wafers. Profound changes were found between samples with different preparations, and time evolution of the CXD pattern was observed during regrowth of the native oxide following HF-stripping.