

Initial Development of a sub-micron Angle Resolved Photoemission Microscope

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We have begun initial development of a sub-micron angle resolved photoemission microscope. The current test system consists of an SES-200 detector and a zone plate based focusing system operating at 180eV photon energy. We have measured angle resolved spectra using the SES-200 angle-dispersive collection mode at resolution of ~500nm. We have used this to show orientational contrast on highly oriented pyrolytic graphite (HOPG). The domains on HOPG are on the order of 1-20 microns and are well orientated along the c-axis but show random azimuthal order. We are able to clearly image these domains even though they show no chemical contrast, and can measure the single crystal band structure on disordered polycrystalline sample. We believe this demonstrates the promise of such a system for the measurement of materials which cannot be found in bulk single crystals.