

Nano-ARPES and nano-photoelectron diffraction at SOLEIL: A new concept in scanning photoelectron microscopy

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A scanning based photoelectron microscope has been constructed at SOLEIL. The beamline delivers photons with energy in the 15-900 eV range, making use of two soft X-ray undulators capable to work in linear and circular polarized light. It comprises of a high resolution variable line spacing (VLS) and varied groove depth (VGP) plane grating monochromator (PGM) with a spectral resolving power of 25000 at 100 eV. This high brightness source illuminates the selected Fresnel zone plate after being focalized by a double Wolter optics and a pinhole. The microscope consists of a set of three Fresnel zone plates with their associated order-selected apertures, a high precision sample scanning stage with a step better than 3 nm and a high resolution R4000 Scienta hemispherical analyzer used to record independent photoemission spectra, or to form images within a fixed electron energy bandwidth as the specimen is mechanically scanned. The data acquisition has been designed to collect up to 9 images concurrently, including different Scienta regions, fluorescence signal from a low energy Bruker detector and total yield from the samples. The design, tests and first results of this recently inaugurated station will be presented.