

On space charge effects in laboratory based photoemission electron microscopy using compact gas discharge EUV sources

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This poster is about the combination of a state-of-the-art PEEM with an intense yet compact gas-discharge light source to exploit the full strength of the photoemission spectroscopy and microscopy. In contrast to synchrotrons, HHG and XFEL light sources, the duration of pulsed emission in the discharge source is on the order of tens of nanoseconds with about $1e8$ photons/mm² per pulse at the sample at 71.7 eV photon energy. We observe decreased lateral resolution and also energetic broadening associated with the increase in a number of photons per area per pulse. We also analyse the performance of the system for different scenarios. Furthermore, we present design and raytracing simulations of a compact tunable imaging monochromator (a combined collector and emission line selector) for 5 to 20 nm wavelength based on a curved grating and a toroidal mirror.