

Is the future bright for simultaneous X-ray ptychography and fluorescence microscopy?

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In recent years scanning X-ray diffraction microscopy (SXDM) has risen to become an almost ubiquitous X-ray imaging method for high resolution quantitative ultra-structural imaging of nano- to micro-sized specimens. Using almost identical beamline arrangements, X-ray fluorescence microscopy (XFM) provides high sensitivity quantitative elemental mapping in similar specimens. Their experimental similarities make these two methods ideally suited to simultaneous data collection, providing both high-resolution structural imaging and high-sensitivity elemental mapping of a range of specimen types and sizes [1-4]. However, despite their similarities SXDM and XFM probe the specimen for different information resulting in vastly different datasets and processing requirements, slightly complicating an otherwise happy relationship [1].

This presentation will highlight some of the key developments in the marriage of SXDM to XFM, with reference to experimental and data acquisition issues that need to be overcome, including data acquisition and handling, coherence, and dose requirements. Looking to the future, I will draw your attention to some cracks in the relationship that will need expert counselling for the happy marriage to continue.

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