X-ray microscopy instrumentation at NSLS-II: from nanoprobes to protein crystallography

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X-ray microscopy is a mature characterization tool routinely applied to elucidate various questions in science, technology and engineering [1-3]. The high penetration power of X-rays allows for employing different characterization methods and revealing elemental composition, crystalline phases, strain distribution, oxidation states etc. in macroscopic and microscopic samples. To obtain comprehensive chemical and structural information at the nanometer scale, an X-ray microscope has to be equipped with adequate capabilities and acquire multiple datasets simultaneously. Full-field or scanning X-ray microscopes typically serve this purpose and complement each other. A number of X-ray microscopes and nanoprobes have been designed, constructed and commissioned around the world recently [4-5]. In this presentation I will provide an overview of microscopy instrumentation developments at NSLS-II, covering a Hard X-ray Nanoprobe scanning system [6-7] along with a recently developed full-field transmission x-ray endstation. Moreover, I will demonstrate how other techniques, such as protein crystallography, can benefit from x-ray microscopy instrumentation developments and utilize the full flux of modern synchrotron facilities. [8]

References

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