☐ **Talk** ☒ **Poster**

High-resolution XRF Imaging and Spectroscopy at the Submicron Resolution X-ray Spectroscopy (SRX) Beamline at the NSLS-II

Andrew M. Kiss[1], Evan J. Musterman[1], and Aswin kumar Anbalagan[1]

[1]*National Synchrotron Light Source II, Brookhaven National Laboratory, Upton, NY. 11973*
Author Email: akiss@bnl.gov

Synchrotron-based X-ray microscopy is a powerful technique that provides researchers with the ability to visualize and measure trace elemental concentrations at high spatial resolutions[1]. Utilizing the state-of-the-art NSLS-II accelerator, the Submicron Resolution X-ray Spectroscopy (SRX) beamline is a hard X-ray nanoprobe that bridges the gap between the micro- and nano-scales. To accomplish the high spatial resolution, the SRX beamline includes a pair of Kirkpatrick-Baez (KB) mirrors capable of achieving a 200 – 500 nm focused beam[2]. The use of KB mirrors provides high incident flux onto the sample and achromatic optics – simplifying operation for spectroscopy measurements. X-ray fluorescence (XRF) maps quickly raster over a sample to build elemental distributions and concentrations with millisecond dwell times. X-ray absorption spectroscopy (XAS) measurements are performed at discrete locations using a fly-scanning approach[3]. This requires coordinated motion between the undulator source, monochromator Bragg angle, and crystal offset to maintain beam position and intensity on the point of interest. The SRX beamline has a tunable incident energy from 4.9 to 20 keV – which allows for XRF elemental mapping and XAS across much of the periodic table. This attracts a diverse user community to the beamline ranging from Earth and environmental sciences, biology, and energy and materials sciences.

References

[1] Y. S. Chu, W.-K. Lee, R. Tappero, M. Ge, X. Huang, X. Xiao, H. Yan, P. Northrup, J. Thieme, A. M. Kiss, G. J. Williams, Y. Yang, S. L. Nicholas, A. Pattammattel, R. Smith, P. Ilinski, Y. Du, *Synch. Rad. News*, **33**(3), 29-36 (2020).

[2] E. Nazaretski, D. S. Coburn, W. Xu, J. Ma, H. Xu, R. Smith, X. Huang, Y. Yang, L. Huang, M. Idir, A. Kiss, Y. S. Chu, *J. Synch. Rad.*, **29**(5), 1284-1291 (2022).

[3] D. Hidas, A.M. Kiss, M. Rakitin, J. Sinsheimer, T. Tanabe, M. Musardo, *Nucl. Instrum. Meth. A*, **1031**, 166505 (2022).