

Towards 10-meV Resolved Resonant Inelastic Soft X-ray Scattering at NSLS-II

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The investigation of low-energy charge, spin and orbital dynamics in correlated electron systems, critical to our understanding of quantum phenomena in materials, has historically driven an international race to push the energy resolution of RIXS to new limits. This race has recently taken a step forward with the construction of new soft x-ray beamlines equipped with next-generation spectrometers at various light sources including the ESRF, TPS, NSLS-II, DLS and MAX IV. The aim of these instruments is to exceed the current state-of-the-art resolution, ~ 100 meV at 1000 eV.

At NSLS-II, the Soft Inelastic X-ray scattering beamline ("SIX") aspires to reach an energy resolution of 10 meV at 1000 eV on both the beamline and the spectrometer. Meeting this goal while maintaining a reasonable countrate requires overcoming a range of unprecedented challenges in optical and mechanical design and fabrication. In this presentation we will review these challenges and our strategies for solving them. I will also give an overview of the current status of the SIX project.

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