

Resonant X-ray Emission Spectroscopy studies for energy materials.

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Advances in equipment have led to dramatic improvements in X-ray analysis, enabling the properties of photons after their interaction with matter to be analyzed in terms of size and energy. A representative technique is HERFD-XANES (High Energy-Resolved Fluorescence Detected –X-ray Absorption Near Edge Structures), which measures X-ray absorption spectral signals using a spectrometer that utilizes the energy decomposition of scattered X-rays. This technique achieves higher energy resolution than conventional absorption spectroscopy, allowing for the observation of unoccupied valence states. However, due to the nature of photons, the measured signal intensity is not large, making it known as a photon-hungry experiment. Additionally, as resolution increases, the signal decreases, which is a limiting factor in material analysis. To improve this, a higher flux of a more ideal light source is required.

We are attempting to obtain high-resolution spectra using HERFD-XANES and analyze the results. Here, we summarize the preliminary experimental results. Additionally, we will simulate the advantages of using a 4GSR light source, given its small emittance, in these experiments, and proceed with research on optical devices for future experiments based on theoretical criteria.

Paper submission Plan

Best Presentation

Contribution track

ICABU WG3. Beamline and Instrumentation

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