



Contribution ID: 213 Contribution code: TUP48

Type: Poster Presentation

Rapid beamline diagnostics for upcoming BESSY II+ SoTeXS beamline

Tuesday 16 September 2025 17:00 (1 hour)

As part of the BESSY II+ * upgrade, the new SoTeXS (Soft-to-Tender X-ray Spectroscopy) beamline will enable high-precision, high-throughput studies of battery materials in the 0.5–5 keV energy range. At the endstation, battery cells with varying material combinations will undergo charging and discharging phases while being exposed to the beam. To ensure that, variations in the measurements are attributable to changes within the cells rather than fluctuations in beam properties, a rapid diagnostics procedure will be implemented. This procedure will monitor beam performance in between the battery measurements. This includes measurement of key parameters such as photon flux, energy resolution, and beam focus. The system combines a retractable ionization chamber for energy resolution measurements and a camera-based setup using OpenCV and ChArUco markers for determining beam spot size and position**. These tools allow beam performance monitoring between sample loading cycles and represent an advance over commissioning-only diagnostics on current BESSY II beamlines. This paper presents the technical requirements of the SoTeXS beamline and a selection of potential diagnostic tools.

Footnotes

*R. Müller et al, “EXPERIMENTAL DATA TAKING AND MANAGEMENT: THE UPGRADE PROCESS AT BESSY II AND HZB”, 19th Int. Conf. Accel. Large Exp. Phys. Control Syst., Cape Town, South Africa , doi:10.18429/JACoW-ICALEPCS2023-MO2AO04

** W. Smith et al., “USING ARUCO CODES FOR BEAM SPOT ANALYSIS WITH A CAMERA AT AN UNKNOWN POSITION”, 19th Int. Conf. Accel. Large Exp. Phys. Control Syst., Cape Town, South Africa, doi :10.18429/JACoW-ICALEPCS2023-THMBCMO30

Funding Agency

Author: KRAFT, David (Helmholtz-Zentrum Berlin für Materialien und Energie)

Co-authors: VIEFHAUS, Jens (Helmholtz-Zentrum Berlin für Materialien und Energie); NOPPEL, Manuel (Helmholtz-Zentrum Berlin für Materialien und Energie); Dr HÖNICKE, Philipp (Helmholtz-Zentrum Berlin für Materialien und Energie); Dr VADILONGA, Simone (Helmholtz-Zentrum Berlin für Materialien und Energie); SMITH, William (Helmholtz-Zentrum Berlin für Materialien und Energie)

Presenter: KRAFT, David (Helmholtz-Zentrum Berlin für Materialien und Energie)

Session Classification: Tuesday Poster Session

Track Classification: BEAMLINES: Beamlines and Instruments