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Motion control of large endstation equipment at NSLS-II

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Experimental endstations often have large mechanical components that can have complex motion control requirements.

The CHX (Coherent Hard X-ray Scattering) beamline at NSLS-II has a long SAXS table with six axes of motion. The table consists of two separate sections, which can be operated independently or in a combined mode. The table can rotate around the sample position and translate in the direction of the scattered beam. Rotations require up to four motors to be coordinated. Equipment and personnel protection interlocks are included in the control system.

The SIX (Soft Inelastic X-ray Scattering) beamline at NSLS-II has a 15 m long spectrometer arm that can rotate around the sample through an arc of 120 degrees. Rotation of the spectrometer arm requires coordination of two motors and integration with an equipment control PLC. Equipment and personnel protection systems are integrated with the motion control.

These motion applications are implemented in Delta Tau Turbo PMAC motion controllers. Personnel safety interlocks are implemented in an Allen Bradley Guard Master configurable safety relay. Operation and status of the motion systems are integrated using EPICS and CS-Studio.

Primary author(s) : LEWIS, Wayne (OspreyDCS); SINSHEIMER, John (Brookhaven National Laboratory)

Presenter(s) : LEWIS, Wayne (OspreyDCS)

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