

New Online Spectrometer Concepts for FELs at Tender and Soft X-ray Energies

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The need for online measurement of X-ray FEL photon spectra for use by experimenters and FEL operators has been recognized and addressed in the development of bent thin crystal spectrometers at LCLS, SACLA, SwissFEL, and the European XFEL, [1-3], all of which measure the photon spectra at hard X-ray energies. However, little has been done to come up with concepts to measure the spectra at tender and soft X-ray energies.

The SwissFEL Aramis at beamline the Paul Scherrer Institut (PSI) has an energy range that encompasses both tender and hard X-ray energies, and the coming Athos beamline will be a soft X-ray beamline. Two new spectrometer concepts, one based on Von Hamos spectroscopy [4], and one based on electron spectroscopy have been developed by the photon diagnostics group at PSI to extend the online measurement of spectra to new ranges. The concepts, plans, and challenges for these new spectrometers will be presented and discussed.

References

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