

# Soft X-ray Detection for TR-RIXS at the Furka Endstation of SwissFEL

*Wednesday, 14 January 2026 09:00 (20 minutes)*

Time-resolved resonant inelastic x-ray scattering (TR-RIXS) provides unique insight into the dynamics of elementary excitations in quantum materials. At the L-edges of 3d transition metals, located in the soft x-ray regime, the intrinsically low cross-section places stringent demands on detector performance. High quantum efficiency is essential to maximize signal yield, while the energy resolution of the spectrometer relies on spatial dispersion, necessitating detectors with excellent spatial resolution and single-photon sensitivity. Moreover, the pulsed nature of the free-electron laser (FEL) radiation requires fast readout time. At the Furka endstation of SwissFEL, TR-RIXS experiments are carried out with a CMOS imager and an in-house developed Jungfrau LGAD sensor, while an in-vacuum Jungfrau detector is employed for time-resolved diffraction. In this contribution, I will present the challenges of soft x-ray detection at an FEL from a user perspective, focusing on achieving high time- and energy- resolution TR-RIXS capabilities.

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**Session Classification:** Applications - III

**Track Classification:** Soft X-ray Detectors: Applications