



# Application of TES spectrometers in advanced x-ray spectroscopy

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Contributors:

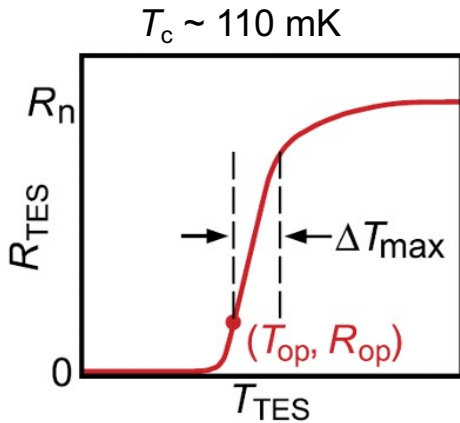
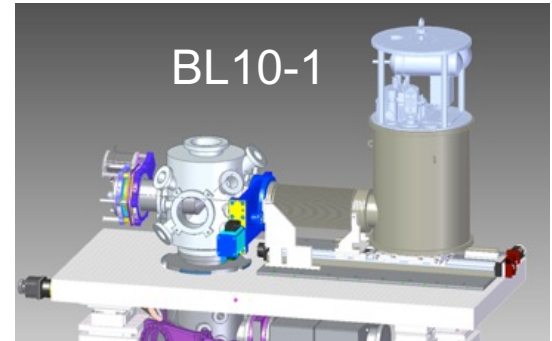
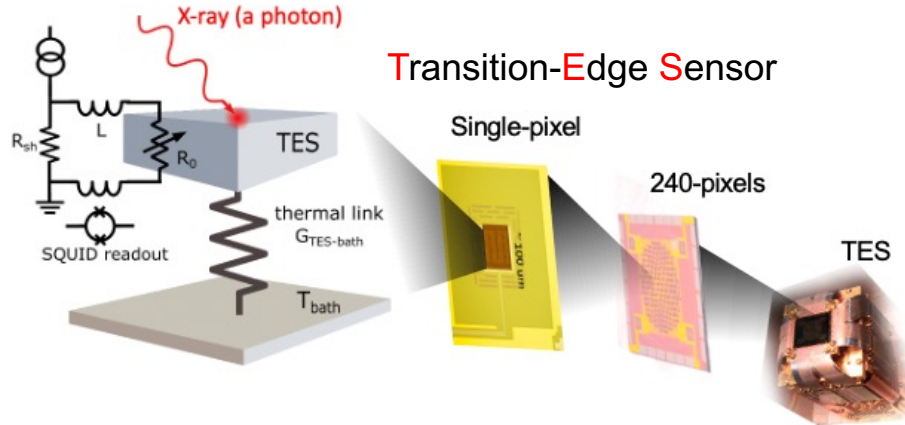
SSRL/SLAC: Jun-Sik Lee, Dennis Nordlund, Donghui Lu

Stanford: Kent Irwin, Jamie Titus

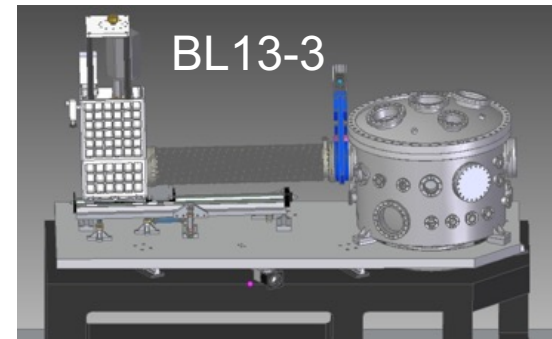
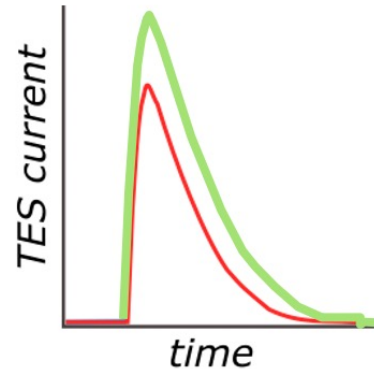
NIST: Galen O'Neil, Randy Doriese, Dan Swetz, Joel Ullom, and QSP

# Basics of the TES spectrometer

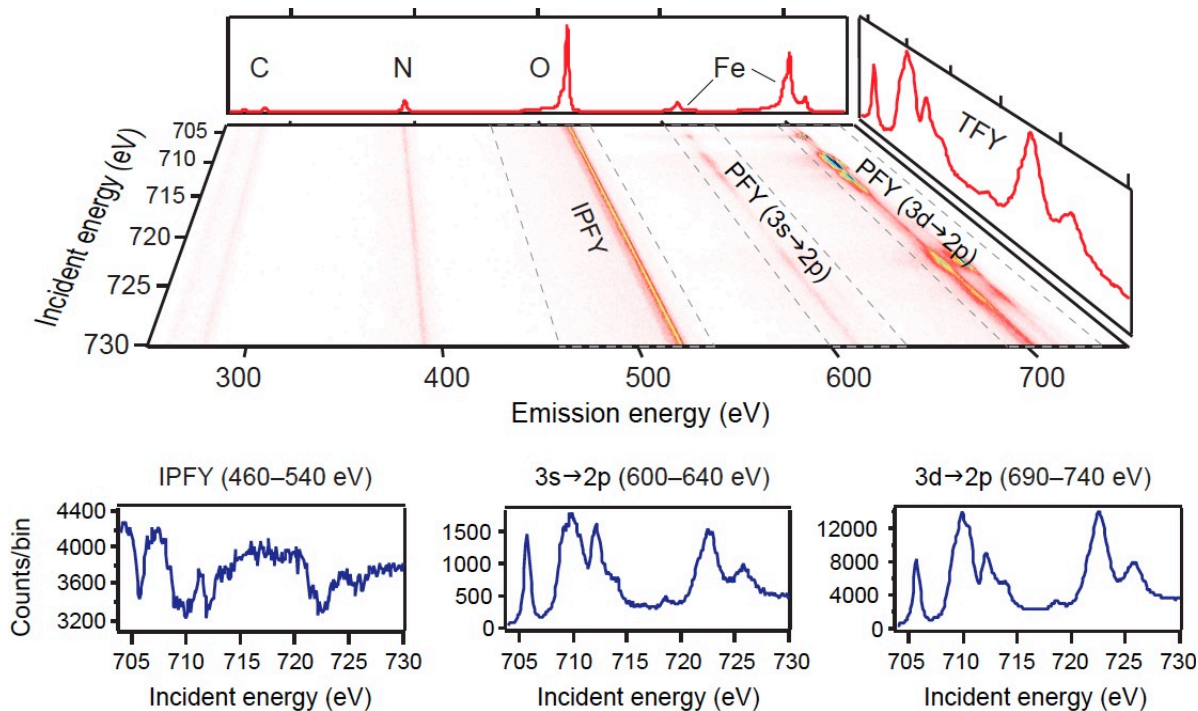
TES spectrometer: energy-dispersive detector made of an array of TESs



Energy dispersive



# TES-RIXS: RIXS with high efficiency, wide-band, high resolution

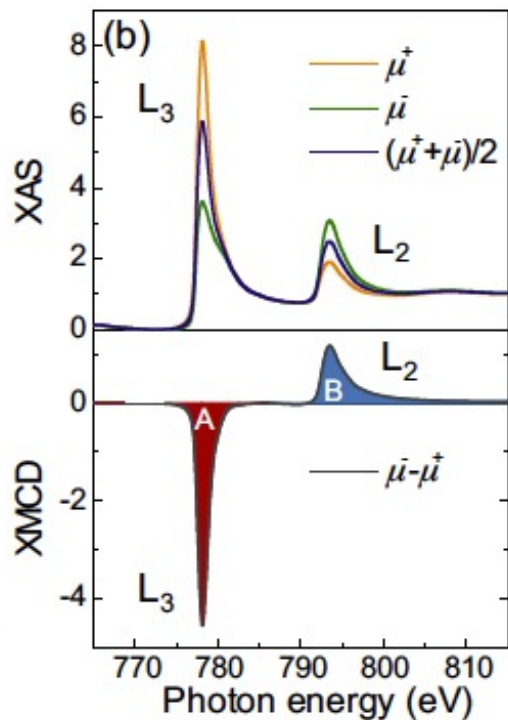


Can be applied to..

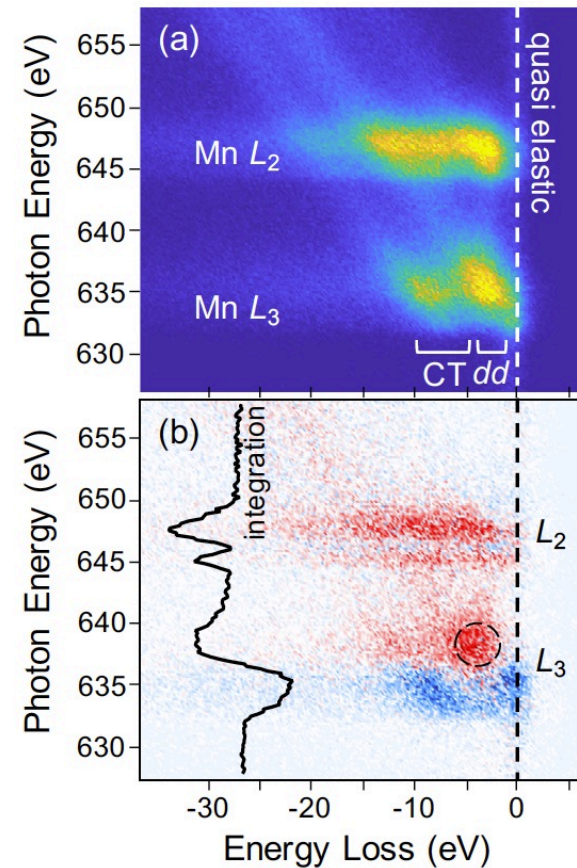
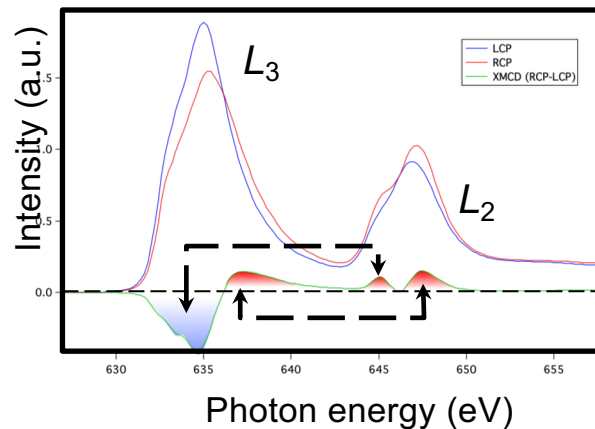
- Ultra-dilute samples
- High-throughput material characterization
- Development of novel spectroscopic methods

# XMCD, its limitation, and RIXS-XMCD

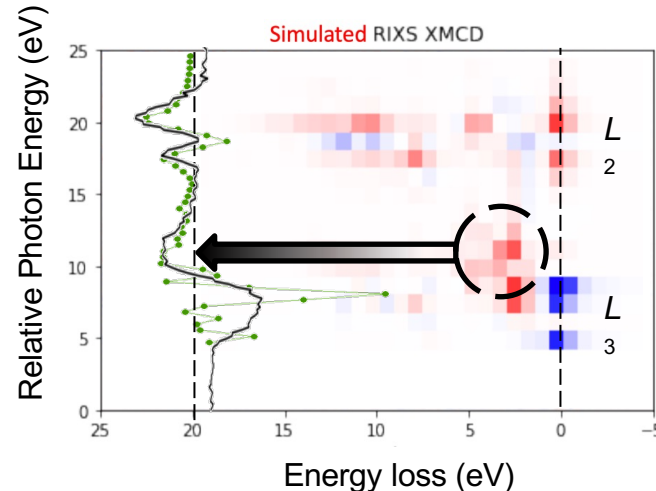
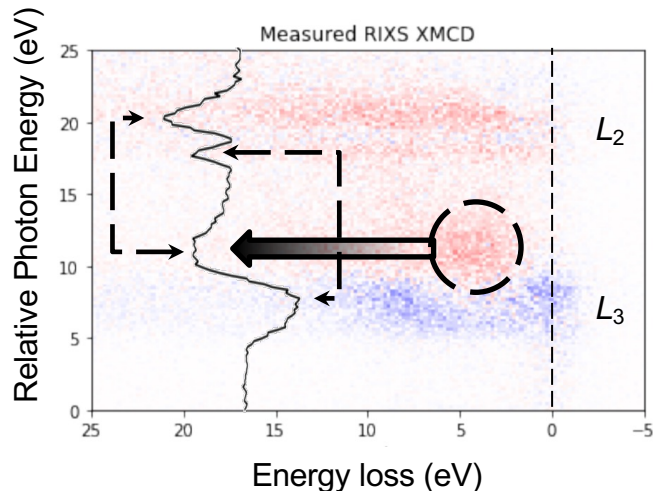
Typically measured in the TEY mode



XAS/XMCD of thin film  $\text{La}_{0.7}\text{Sr}_{0.3}\text{MnO}_3$



# Measured and simulated RIXS-XMCD



## Conclusion

- TES-based RIXS-XMCD provides hidden information not accessible in regular XAS-XMCD.
- From measurement-simulation comparison, we aim at developing an analytic approach for RIXS-XMCD (c.f., the XMCD sum rules).
- A bigger, faster, better resolution TES is highly desired for this study (see the following talk by Galen).