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## Application of TES Microcalorimeters to Synchrotron-Based Forefront X-ray Science (A Tale of Two TESs)

*Thursday, July 25, 2019 9:15 AM (15 minutes)*

In this talk, I will discuss two TES spectrometers we commissioned at Stanford Synchrotron Radiation Light-source (SSRL) at SLAC. Both spectrometers are almost identical in that they are based on 240-pixel TES microcalorimeter arrays of the same design that are operated in ADR cryostats and read out by time-domain multiplexing (TDM). They have shown similar detector performance as well. Despite their similarity, how they are integrated into their host experimental stations is quite different. The first spectrometer was commissioned in the spring of 2016 at the soft X-ray spectroscopy beamline (BL) 10-1 with a scientific motivation to probe the electronic structure of ultra-dilute samples that is not accessible with any other technique. The spectrometer is now open to general user programs, and has been running at its full capacity. So far many user groups have used the TES, yielding scientific outcomes and spreading the success of the TES program. The second spectrometer was commissioned relative recently, in the spring of 2018. It was installed at the soft X-ray scattering end-station BL 13-3 with a scientific motivation to investigate high T<sub>c</sub> superconductors. The TES at BL 13-3 is currently in a feasibility test mode, where we already obtained interesting scientific results. In this talk, I will discuss our efforts to seamlessly integrate the TES to the existing synchrotron environment, show early results with a focus on the study of high T<sub>c</sub> superconductors, and discuss limitations and challenges of the spectrometers.

### Less than 5 years of experience since completion of Ph.D

N

### Student (Ph.D., M.Sc. or B.Sc.)

N

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