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Identifying strongly correlated elements of a moderately correlated wavefunction in URu2Si2 with resonant inelastic X-ray scattering[1]
L. ANDREW WRAY, HAOWEI HE, LIN MIAO, New York University, JONATHAN DENLINGER, YI-DE CHUANG, WANLI YANG, Advanced Light Source, Lawrence Berkeley National Laboratory, NICHOLAS BUTCH, NIST, BRIAN MAPLE, UC San Diego, ALEXANDER GRAY, Temple University, HERMAN DRR, Stanford Institute for Materials and Energy Sciences, SLAC — The RIXS technique is best known for significant breakthroughs in the investigation of strongly correlated materials such as cuprates. However, the rapid advancement of RIXS spectrographs has made it increasingly attractive to apply the technique to a broad range of quantum materials outside of this comfort zone. This talk will review lessons learned from our recent measurements on material systems that feature a balance of correlated and itinerant physics, focusing on the hidden order compound URu2Si2, and touching on VO2 and Prussian blue analogue battery electrodes. RIXS spectra are found to reveal essential features defining low energy degrees of freedom in these moderately correlated wavefunctions. In the case of URu2Si2, we show that a principal energy gap defining strong correlations is fragile, and can be melted via modest chemical doping.

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