

Abstract Submitted
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Is Resonant X-ray Scattering Sensitive to the Electronic Structure of the CDW State? J.-D. SU, School of Applied and Engineering Physics, Cornell University, Ithaca, NY 14853, J.D. BROCK, School of Applied and Engineering Physics, Cornell University, Ithaca, NY 14853, K.D. FINKELSTEIN, Cornell High Energy Synchrotron Source, Ithaca, NY 14853 — The strong “white-line” observed at the Ta L_{III} x-ray absorption edge (9.881KeV) in $1T$ -TaS₂ indicates resonance with the $2p \rightarrow 5d$ atomic transition. Theories of the charge density wave (CDW) state in TaS₂ highlight the special role played by the 5d states of the thirteen Ta atoms in each unit cell of the super-lattice in forming the reconstructed conduction bands of the CDW state. By measuring the resonant diffraction at the CDW satellites, we combine this additional periodicity with the resonant scattering to amplify and isolate the x-ray signal from the CDW. Then, by studying the behavior as the system goes through the incommensurate-commensurate transition, we probe the sensitivity of this resonant x-ray scattering technique to changes in the electronic structure near the Fermi surface.

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