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Investigation of the electronic structure of $TiTe_2$ using ARPES
JIANQIAO MENG, GEY-HONG GWEON, ANDREW LAFORGE, SRIRAM SHASTRY, Department of Physics, UC Santa Cruz, ARTHUR PENN RAMIREZ, Baskin School of Engineering, UC Santa Cruz, ZACK SCHLESINGER, Department of Physics, UC Santa Cruz, KAI ROSSNAGEL, Institute for Experimental and Applied Physics, University of Kiel, DEPARTMENT OF PHYSICS, UC SANTA CRUZ TEAM, BASKIN SCHOOL OF ENGINEERING, UC SANTA CRUZ COLLABORATION, INSTITUTE FOR EXPERIMENTAL AND APPLIED PHYSICS, UNIVERSITY OF KIEL COLLABORATION — $TiTe_2$ is considered a model Fermi liquid material in the field of angle-resolved photoelectron spectroscopy (ARPES). Over the years, many groups have contributed to improving the quality of the ARPES data on $TiTe_2$, helping to understand the connection between the ARPES data and the transport properties. However, some key questions remain unanswered, the most outstanding one being the anomalous temperature dependence in the Hall coefficient R_H. Here, we present a detailed high resolution ARPES data set in a wide range of temperature and momentum. This reveals some new features: temperature dependence in the band width, temperature dependence of the Ti 3d and Te 5p occupancies, and subtle features in the line shapes as the peak crosses the Fermi level. We discuss these new features in comparison with previous ARPES studies and known transport properties.

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