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APRES study of a complex charge density wave material Gd_2Te_5[1]
RUIHUA HE, KYUNGYUN SHIN, HONG YAO, Applied Physics & Physics, Stanford University & SSRL, JUDE LAVEROCK, STEPHEN DUGDALE, Department of Physics, University of Bristol, UK, NANCY RU, DONGHUI LU, WORAWAT MEEVASANA, STEVE KIVELSON, IAN FISHER, ZHI-XUN SHEN, Applied Physics & Physics, Stanford University & SSRL — By using angle-resolved photoemission spectroscopy based on synchrotron radiation as well as monochromatic He-I UV, we have investigated for the first time a complex charge density wave (CDW) material, Gd_2Te_5, of the rare earth (R) telluride family R_2Te_5, with a hybrid crystalline structure of its two well-studied relatives, RTe_2 and RTe_3. Based on a tight-binding model, combining with the LDA calculation, we analyze the experimental Fermi surface, energy band dispersions and their temperature dependence in detail, which provides valuable insights into its complex CDW phase revealed recently by the TEM and XRD measurements. The nature of different CDW wave vectors involved and the roles of different interlayer split bands in the CDW formation are discussed.

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Ruihua He
Applied Physics & Physics, Stanford University & SSRL

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