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ARPES Study of Triple Layer Nickelate $R_4Ni_3O_{10}$ ($R=Pr, La$)

HAOXIANG LI, XIAOQING ZHOU, THOMAS NUMMY, Department of Physics, University of Colorado at Boulder, Boulder, CO 80309, USA, JUNJIE ZHANG, Material Science Division, Argonne National Lab, Argonne, IL 60439, USA, VICTOR PARDO, Departamento de Fisica Aplicada, Universidade de Santiago de Compostela, E-15782 Campus Sur s/n, Santiago de Compostela, Spain, WARREN E. PICKETT, Department of Physics, University of California, Davis, CA, 95616, USA, JOHN F. MITCHELL, Material Science Division, Argonne National Lab, Argonne, IL 60439, USA, DANIEL S. DESSAU, Department of Physics, University of Colorado at Boulder, Boulder, CO 80309, USA — Layered nickelates present a similar crystal and electronic structure to the high- T_c cuprates. They are potential candidates to host superconductivity, and have demonstrated intriguing anomalies in resistivity, magnetic susceptibility, and specific heat [1-3]. Here we present an ARPES study of the triple layer nickelate $R_4Ni_3O_{10}$ ($R=Pr, La$) and compare it with density functional calculations. A large hole pocket centered at the zone corners similar to the cuprates is observed, with additional zone folding due to the structural/magnetic cell doubling. An additional band-like feature is found near the Fermi surface at the gamma point, and shows a different symmetry than that of the hole pocket. These details of the fermiology and their relevance to the properties of these materials will be discussed. [1] Z. Zhang et al. J. Solid State Chem. 117, 236 (1995). [2] M. D. Carvalho et al. J. Appl. Phys. 88, 544 (2000). [3] M. Zinkevich et al. J. Alloys Compd. 438, 92 (2007).

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