

Abstract Submitted
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Probing the hybridization gap in heavy fermions by temperature dependent ARPES¹ CRIS ADRIANO, University of Illinois at Chicago, FANNY RODOLAKIS, Argonne National Laboratory, PRISCILA ROSA, University of Campinas, FRANCISCO RESTREPO, DIMITAR TENEV, University of Illinois at Chicago, MUCIO CONTINENTINO, Centro Brasileiro de Pesquisas Físicas, ZACHARY FISK, University of California at Irvine, JUAN CARLOS CAMPUZANO, University of Illinois at Chicago, PASCOAL PAGLIUSO, University of Campinas — We report temperature dependent angle-resolved photoemission spectroscopy (ARPES) for pure and Cd-doped Ce_2RhIn_8 heavy fermion compounds. Our results reveal that for Ce_2RhIn_8 at $T = 100$ K once the f - conduction electrons magnetic scattering becomes larger than the phonon scattering, even states of different parities can hybridize, forming many-body quasiparticles with heavy masses. We further show that at a temperature of 20 K, where the hybridization of conduction electrons and f states is stronger, a spectral gap is observable in the ARPES spectra. Interestingly, when replacing In by Cd to tune the local density of conduction electrons states at the Ce^{3+} site, we find a strong reduction of the f - conduction electrons hybridization strength, and the suppression of the hybridization gap at low temperatures. We also observe that the f states near the chemical potential hybridize mostly with out-of-plane p states (presumably from In). These findings have important consequences for the understanding of the different antiferromagnetic and exotic superconducting ground states that occur in these families of materials.

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