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Fermi surface collapse, gap, coherence: an ARPES study of the hybridization in Ce_2RhIn_8 FANNY RODOLAKIS, Argonne National Laboratory, CRIS ADRIANO, University of Campinas, FRANCISCO RESTREPO, University of Illinois at Chicago, PRISCILA F.S. ROSA, PASCOAL PAGLIUSO, University of Campinas, JUAN CARLOS CAMPUZANO, University of Illinois at Chicago — The crossover of localized magnetic moments at high temperatures into itinerant states of heavy mass at low temperatures in some metals containing f electrons, first addressed by Kondo, is a fundamental problem in condensed matter physics involving a temperature dependent hybridization between f levels and conduction electrons (ce). Here we present an extensive angular resolved photoemission spectroscopy study performed in Ce_2RhIn_8 as a function of temperature. Our experiments reveal the presence of three energy scales, differing by an order of magnitude from each other: first at room temperature, where the f levels are localized, we observe a small Fermi surface (FS), which undergoes dramatic topological changes toward a large FS near the minimum in the resistivity around 200K; the opening of a spectral gap below 30K without a change in topology of the Fermi surface; and finally, below 5K, composite quasiparticles form, as the resistivity suddenly decreases. The expectation that hybridization, spectral gap, and f electron coherence go hand in hand should be expanded to include the possibility of separate energy scales for each of these phenomena.

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