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Hybridization and coherence in the intermediate valence compound $YbAl_3$ via quasiparticle scattering spectroscopy (QPS)[*] L.H. GREENE, S.M. NARASIWODEYAR, M. DWYER, W.K. PARK, University of Illinois at Urbana-Champaign, P.C. CANFIELD, Iowa State University — Band renormalization and hybridization in Anderson lattices has been a subject of continued interest [1]. The intermediate valence compound $YbAl_3$, which does not order magnetically nor superconducts, is a good model system for the study of the hybridization process. A microscopic understanding is still lacking although some characteristic temperature and energy scales have been identified. As shown by our previous works [1,2], QPS is a powerful tool to investigate the hybridization process via measurement of the hybridization gap. Here we report our recent QPS results on $YbAl_3$ [3]. Conductance spectra over a wide temperature range indicate that the hybridization process begins around 110 K, a new temperature scale found in this study, well before the full coherence is achieved ($\sim$ 34 K). Our observations agree with the slow crossover scenario discussed recently in the literature [4]. The hybridization gap opens concomitantly with the emergence of a coherent Fermi liquid, suggesting that its measurement can be a more rigorous way to define the coherence temperature. [*]The work at UIUC is supported by the NSF DMR 12-06766 and the work done at Ames Lab. was supported under Contract No. DE-AC02-07CH11358.

[1] W. K. Park *et al.*, PRL **108**, 246403 (2012); [2] W. K. Park *et al.*, Philos. Mag. (2014), DOI:10.1080/14786435.2014.909613; [3] W. K. Park *et al.*, to be submitted; [4] S. Burdin and V. Zlatić, PRB **79**, 115139 (2009).

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