Momentum and thickness-dependent evolution of quantum well states in the Cu/Co/Cu(001) system\textsuperscript{1} M.A. VAN HOVE, LBNL, Berkeley, and UC-Davis, J.M. AN, A. CANNING, L.-W. WANG, E. ROTENBERG, LBNL, Berkeley, Y.Z. WU, Z.Q. QIU, LBNL, Berkeley, and UC-Berkeley — Experimental advances in sample fabrication allow the observation of individual quantum well (QW) states from discrete atomic layer thicknesses. We present comprehensive angle-resolved photoemission measurements of the Fermi surface and underlying band structure of QW states in Cu/Co/Cu(001). Compared to bands from normal emission, we find a complicated evolution of QW states as a function of the thickness of both the copper overlayer and the cobalt barrier layer, as well as of the emission angle. This reveals a very high sensitivity of “off-normal” QW states to film thickness. Self-consistent calculations reveal a significant interaction between the QW states in the Cu overlayer and the Co barrier states, which leads to the observed complex behavior in particular ranges of energy and emission angle.

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