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**Revealing the superconducting state of CaC6 by angle-resolved photoelectron spectrocopy** SHUOLONG YANG, JONATHAN SOBOTA, Stanford Institute for Materials and Energy Science;Geballe Laboratory for Advanced Materials, Department of Physics and Applied Physics, Stanford, CA, CHRIS HOWARD, CHRIS PICKARD, London Centre for Nanotechnology and Department of Physics and Astronomy, University College London, London, UK, MAKOTO HASHIMOTO, DONGHUI LU, Stanford Institute for Materials and Energy Sciences, SLAC, CA, SUNG-KWAN MO, Advanced Light Source, Materials Science Division, Lawrence Berkeley National Laboratory, Berkeley, CA, MARK ELLERBY, London Centre for Nanotechnology and Department of Physics and Astronomy, University College London, London, UK, ZHI-XUN SHEN, Stanford Institute for Materials and Energy Science;Geballe Laboratory for Advanced Materials, Department of Physics and Applied Physics, Stanford, CA — We studied the electronic band structure of $CaC_6$ using angle-resolved photoelectron spectroscopy (ARPES). We were able to make direct connections to the DFT calculation and identify various electron- and hole-pockets both at the Γ- and K-points. Most importantly, we convincingly observed the interlayer band, which was predicted to be responsible for superconductivity and to display a near-free-electron-like dispersion. The near-circular Fermi surface of the interlayer band is clearly separate from the carbon-derived bands, which enables a pocket-dependent superconducting gap analysis near the Γ-point. Distinct electron-phonon coupling regimes were observed for the interlayer and the carbon-derived bands using self-energy analysis in agreement with previous studies.

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