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Anisotropic Electron-Phonon Coupling on Graphene-Derived Fermi Surface in CaC_6[1] TONICA VALLA, J. CAMACHO, Brookhaven National Laboratory, Z-H. PAN, A.V. FEDOROV, Lawrence Berkeley National Laboratory, A.C. WALTERS, C.A. HOWARD, M. ELLERBY, University College London —
Superconductivity in graphite intercalated compounds had been studied for more than 40 years and it is still not fully understood, despite the recent progress and the discovery of relatively high Tc superconductivity in CaC_6 and YbC_6. Initially, even unconventional mechanisms, such as excitonic and plasmonic pairing were considered, but recent studies now suggest that superconductivity in graphite intercalated compounds is more conventional and that the electron-phonon coupling is responsible for pairing. However, it is still not clear whether the graphene-derived electronic states and vibrations or the intercalant-derived ones play more important role, or if some particular combination of graphene-intercalant states and vibrations dominates the coupling. Here, we present angle-resolved photoemission studies of electronic structure in CaC_6. We find that the electron-phonon coupling on the graphene-derived Fermi surface is very strong and anisotropic, reflecting the interaction of graphene-derived states with high-frequency graphene-derived vibrations.

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