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Band structure of a superconducting topological metal LEWIS WRAY, Princeton University, HSIN LIN, ARUN BANSIL, Northeastern University, YEWSAN HOR, ROBERT CAVA, ZAHID HASAN, Princeton University —
The $Cu_xBi_2Se_3$ system is a topological insulator that has recently been shown to undergo a superconducting transition upon copper doping, raising the possibility that it may be the first known "topological superconductor". We use angle resolved photoemission spectroscopy to examine the band structure at several copper doping values, observing evolution of the bulk and surface state conduction bands. The addition of copper is found to result in nonlinear electron doping and strong renormalization of the surface state. Characteristics of the three dimensional bulk band structure are discussed in detail with respect to the superconducting state and topological properties. Six-fold rotational anisotropy is evident in the doped conduction bands, with important implications for low energy interactions and potential device development.

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