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[632] Three-dimensional Fermi surface of overdoped La-based cuprates

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We have performed soft x-ray angle-resolved photoemission spectroscopy (ARPES) measurements on overdoped La-based cuprates $\text{La}_{2-x}\text{Sr}_x\text{CuO}_4$ and $\text{Eu}_{0.2}\text{La}_{1.8-x}\text{Sr}_x\text{CuO}_4$, and investigated the band structure in three-dimensional momentum space. While nodal part of the Fermi surface was k_z independent, significant k_z -dispersion was unveiled in the antinodal portion. From the band structure fitted to the tight-binding model, we have demonstrated that the significant k_z dispersion suppresses the enhancement of the density of states (DOS) by van-Hove singularity (VHS). Our results suggest that the enhancement of electronic specific heat observed in La-based cuprates is caused by quantum criticality rather than by simple DOS divergence at VHS.

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