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Electron Correlation and Fermi Surface Topology of Na_xCoO_2
SEN ZHOU, Boston College, MENG GAO, Boston College, HONG DING, Boston College, PATRICK LEE, Massachusetts Institute of Technology, ZIQIANG WANG, Boston College — The electronic structure of Na_xCoO_2 revealed by recent photoemission experiments shows important deviations from band theory predictions. The six small Fermi surface pockets predicted by LDA calculations have not been observed as the associated e'_g band fails to cross the Fermi level for a wide range of sodium doping concentration x. In addition, significant bandwidth renormalizations of the t_{2g} complex have been observed. We show that these discrepancies are due to strong electronic correlations by studying the multi-orbital Hubbard model in the Hartree-Fock and strong-coupling Gutzwiller approximation. The quasiparticle dispersion and the Fermi surface topology obtained in the presence of strong local Coulomb repulsion are in good agreement with experiments.

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