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Bogoliubov-de Gennes analysis of *d*-wave superconductors through an ARPES-parameterized Hubbard model

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Starting from the generalized Hubbard model, in which correlated-hopping interactions are included in addition to the repulsive Coulomb ones [1], we solve numerically the Bogoliubov-de Gennes equations [2] in order to quantify the magnetic-field effects on the critical temperature, *d*-wave superconducting gap, and the electronic specific heat. Since the *z*-direction applied magnetic field breaks the translational symmetry on the CuO_2 planes, the supercell method is used and the Bogoliubov-de Gennes equations are self-consistently solved [3]. In particular, this Hubbard model involves both single and correlated electron hopping parameters between first and second neighbors. Within the mean-field approximation, we have determined these parameters from the Angle Resolved Photoemission Spectroscopy (ARPES) data [4]. Finally, experimental implications of our numerical results are also discussed.

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