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Two band model for the cuprates SHIU LIU, STEVEN WHITE, UC, Irvine — We use a numerical canonical transformation approach to derive an effective two-band model for the hole-doped cuprates, which keeps both oxygen and copper orbitals but removes double occupancy from each. A similar model was considered previously by Frenkel, Gooding, Shraiman, and Siggia (PRB 41, number 1, page 350). We compare the numerically derived model with previously obtained analytical results. In addition to the usual hopping terms between oxygens t_{pp} and Cu-Cu exchange terms J_{dd}, the model also includes a strong copper-oxygen exchange interaction J_{pd} and a Kondo-like spin-flip oxygen-oxygen hopping term K_{pdp}. We use the density matrix renormalization group to study the charge, spin, and pairing properties of the derived model on ladder systems.

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