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Andreev and Single-Particle Tunneling Spectra of Underdoped Cuprate Superconductors KUN HUANG, Department of Physics, The University of Hong Kong, Hong Kong, KAI-YU YANG, Institut fuer Theoretische Physik, ETH Zurich, WEI-QIANG CHEN, Department of Physics, The University of Hong Kong, Hong Kong, T.M. RICE, Institut fr Theoretische Physik, ETH Zurich, FU-CHUN ZHANG, Department of Physics, The University of Hong Kong, Hong Kong — We study tunneling spectroscopy between a normal metal and an underdoped cuprate superconductor modeled by a phenomenological theory in which the pseudogap is a precursor to the undoped Mott insulator. In the low barrier tunneling limit, the spectra are enhanced by Andreev reflection only within a voltage region of the small superconducting energy gap. In the high barrier tunneling limit, the spectra show a large energy pseudogap associated with single particle tunneling. Our theory semi- quantitatively describes the two gap behavior observed in tunneling experiments.

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