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Investigation of Competing Orders and Quantum Criticality in Cuprate Superconductors using Scanning Tunneling Microscopy CHING-TZU CHEN, N.-C. YEH, Department of Physics, California Institute of Technology, USA, M.-S. PARK, K.-H. KIM, SUNG-IK LEE, Department of Physics, Pohang University, Korea, SETSUKO TAJIMA, Superconductivity Research Laboratory, ISTEC, Japan — The existence of competing orders in cuprate superconductors and their proximity to quantum criticality give rise to a variety of non-universal phenomena. To investigate this issue, we study the quasi-particle tunneling spectra of various cuprates with a low- temperature scanning tunneling microscope. Specifically, we will present the temperature evolution and the spatial variation of the quasi-particle tunneling spectra of the s-wave pairing electron-doped infinite-layer $Sr_{0.9}La_{0.1}CuO_2$ and the d-wave pairing optimally hole-doped $YBa_2Cu_3O_x$. We will compare the spectroscopy with bulk magnetic measurements as a function of applied field and discuss the physics implication.

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