

Abstract Submitted  
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**Exploring the effect of the Tunneling Matrix Element on Scanning Tunneling Spectroscopy** EDUARDO CALLEJA, JACOB ALLDREDGE, University of Colorado at Boulder, GENDA GU, Brookhaven National Laboratory, KYLE MCELROY, University of Colorado at Boulder — The results from scanning tunneling spectroscopy (STS) are usually interpreted with the assumption of a simple energy independent matrix tunneling element. This implies that the STS spectrum is a pure representation of the local density of state (LDOS). Recent work by A. Bansil *et al.* (*Phys. Rev. Lett.* **102**, 037001 (2009)) suggests, at least in  $\text{Bi}_2\text{Sr}_2\text{CaCu}_2\text{O}_{8+d}$ , that the matrix element strongly modifies the STS spectrum making it different from the LDOS. We present experimental studies exploring the dependence of the STS spectrum on the tunneling matrix element. By studying the tunneling current as a function of the available parameters we can explore the matrix element's effect on the STS.

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