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Simultaneous AFM-STM on BSCCO DREW EDELBERG, MIHIR BHASKAR, PINSHANE HUANG, ABHAY PASUPAHY, Columbia University — Scanning tunneling microscopy is limited by its inability to resolve the difference between local electronic structure and surface topography since the tunneling current is a convolution of electronic density and tip height. Such a limitation is especially problematic in studying strongly correlated materials on the verge of the insulating state that exhibit strong local variations in the density of electronic states. Recently, non-contact AFM [1] has emerged as a force-based technique capable of providing atomic resolution height information above a surface, allowing us to decouple electronic features from atomic structure. In this work, we describe the use of nc-AFM to study the surface of the high-temperature superconductor BSCCO with atomic resolution in the superconductor and pseudogap phases. By mounting an STM tip to the nc-AFM probe, we measure the true position-dependent density of states independent of tunneling junction normalization. We will demonstrate that performing dI/dV spectroscopy at constant force feedback is a powerful tool that provides additional physical information about local charge in a correlated material. [1] F. J. Giessibl et al., Nanotechnology **15**, S79-S86 (2004).

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