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Tunneling Spectroscopy of Single Cu-O layer Cuprate Superconductors JOHN ZASADZINSKI, MARK WARREN, ADAM DENCHFIELD, Department of Physics, Illinois Institute of Technology — Tunneling spectroscopy data using a mechanical contact method on single-layer cuprate superconductors are reviewed. Superconductors with relatively high Tc (85-90K) such as Tl2201 reveal spectra quite similar to those found on the two-layer Bi2212 compound including sharp coherence peaks and low zero bias conductance consistent with a d-wave density of states (DOS) with a relatively small scattering rate Γ. Lower Tc single-layer cuprates such as La214 compounds reveal smaller gaps as expected but with significantly larger Γ values. This trend continues with Bi2201 (Tc˜5K) where the spectra are broadened even further. The data suggest that the origin of the lower Tc values originates in a depairing mechanism likely tied to potential scattering in the Cu-O plane, arising from instrinsic disorder. Despite the additional broadening, an above-gap spectral dip is found in all junctions indicating coupling to a bosonic mode such that $\Omega<2\Delta$.

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