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Extracting the Bosonic Spectra of Pb Using Superconducting-Tip STS and Comparing it with the Cuprates F.C. NIESTEMSKI, Stanford University, S. JOHNSTON, IFW Dresden, A.W. CONTRYMAN, C.D. CAMP, T.P. DEVEREAUX, H.C. MANOHARAN, Stanford University — In high-temperature superconductors the meaning of the common feature labeled "peak-dip-hump" is still a point of great debate. In terms of scanning tunneling spectroscopy (STS) this refers to the shape of satellite features that occur outside the coherence peaks in the dI/dV spectra. There are many conflicting interpretations and labeling schemes for this feature in both the hole- and electron-doped cuprates. The path to resolving this confusion is to study a well-understood BCS superconductor to better observe the way that the STM measures bosonic information. Utilizing the ultra-low electronic noise of our home-built low-temperature STM, and utilizing a superconducting tip for increased spectral resolution, we recreate the original McMillan and Rowell S-I-S junction[1] with the STM equivalent (S-Vacuum-S). This method provides very high energy resolution for both the filled and empty electronic states in both the superconducting and normal state. We compare this data to first-principle Eliashberg calculations and relate this data to "peak-dip-hump" in the high T_c case.

[1]W. L. McMillan and J. M. Rowell Phys. Rev. Lett., **14**, 108-112 (1965)

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