Abstract Submitted
for the MAR09 Meeting of
The American Physical Society

Interpreting the Gap Signatures in the Raman Spectra of Hg-1201. JAMES STOREY, University of Cambridge, JEFFERY TALLON, Industrial Research Limited — Recently, peaks in the B1g and B2g Raman spectra of the Hg-1201 high-Tc cuprate superconductor have been interpreted in terms of two gaps. These are i) a gap near the Brillouin zone boundary that decreases monotonically with doping, and ii) a gap near the zone-diagonals that follows the dome-shaped doping dependence of the superconducting transition temperature. The former has come to be interpreted as the pseudogap and the latter the superconducting gap. However, this dome shaped superconducting gap contradicts other measurements (specific heat and infra-red spectroscopy) which suggest a simple monotonic decrease with doping. By performing calculations in which the doping dependence of the Fermi arcs is taken into account, we show that the apparent Raman B2g gap is modified by the pseudogap and that the actual superconducting gap deduced from Raman data is in fact consistent with the monotonic decrease seen in these other spectroscopies.

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Date submitted: 19 Nov 2008 Electronic form version 1.4