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Determining the pseudogap Dirac point in the underdoped cuprate superconductors using FT-STs and AC-ARPES E.J. NICOL, K.A.G. FISHER, University of Guelph, J.P. CARBOTTE, McMaster University — Prominent in the underdoped cuprate superconductors is the existence of a pseudogap in the excitation spectrum which opens above T_c but below a temperature T^* . Whether this gap is the same as the superconducting energy gap or is a manifestation of a competing order independent of the superconductivity remains an open and central question. If there are two distinct gaps of d -wave symmetry, they each will exhibit a Dirac point at a different energy and momentum in the band structure. We demonstrate how to find the pseudogap Dirac point by using quasiparticle interference (QPI) measurements from Fourier transform scanning tunneling spectroscopy (FT-STs) or by extrapolating information from the autocorrelation function of angle-resolved photoemission spectroscopy (AC-ARPES) to positive energies. Current examination of photoemission data supports our proposal and suggests that a Dirac point exists at positive energy relative to the Fermi level.

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