Abstract Submitted
for the MAR06 Meeting of
The American Physical Society

Tunneling Density of States for 2D Fermi Liquid[1] GODFREY GUMBS, Hunter College of CUNY, EUGENE KOGAN, Bar-Ilan University, Israel — We calculate the Green's function for an interacting two-dimensional electron liquid whose strength of interaction is characterized by the electron density parameter r_s. The screened electron-electron interaction is expressed in terms of a frequency and wave vector-dependent dielectric function $\varepsilon(q,\omega)$. If this screening is neglected, the tunneling density of states (DOS) is strongly modified due to electron-electron interaction. In particular, in this case, the DOS has a dip near the Fermi energy whose width increases with r_s. By treating $\varepsilon(q,\omega)$ in the hydrodynamical approximation, we investigate the way in which the tunneling DOS is modified at various electron densities, due to screened interaction. Preliminary results show considerable modification of the tunneling DOS at large r_s for both a noninteracting and unscreened electron system. When there is screening, the dip becomes less pronounced but survives.

[1]Supported by Fulbright Foundation

Godfrey Gumbs
Hunter College of CUNY

Date submitted: 23 Nov 2005 Electronic form version 1.4