

Abstract Submitted
for the MAR05 Meeting of
The American Physical Society

Electron excitations in doped semiconducting carbon nanotubes

EUGENE PIVOVAROV, MICHAEL FOGLER, UC San Diego — We compute the dispersion of electron excitations of a doped semiconducting carbon nanotube based on a model of a one-dimensional electron gas with Coulomb interaction and two-fold orbital degeneracy. The $SU(4)$ symmetry of the model leads to a rich spectrum with multiple isospin modes in addition to the usual plasmons and spinwaves. A recently developed approximate mapping of the problem in hand onto integrable models enables us to do computation in the most interesting strongly correlated regime of low doping, where velocities of the isospin and plasmon modes become very different. We discuss anomalous transport and tunneling properties that may be observable in this regime.

Eugene Pivovarov
UC San Diego

Date submitted: 05 Dec 2004

Electronic form version 1.4