

Abstract Submitted
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Effect Of Electron Correlation In Carbon Nanotubes RUSSELL SELVA, JOHN ADAMS, YURIY MALOZOVSKY, Southeastern Louisiana University — We study the electron correlation in the armchair carbon nanotubes (CNT). We model the carbon nanotube as a tubule with electrons confined to the surface of the tubule by an attractive delta-function potential. We derived the dynamic pair interaction potential between two electrons in the tubule incorporating short-range and exchange correlation. Dispersion of plasma modes at different values of angular momentum and single-particle excitations are derived as well. We find that the plasma modes are not Landau damped and the lowest mode has acoustic behavior. We also evaluate the self-energy part due to the interaction of an electron with acoustic mode. We find that the multiple scattering of an electron on the plasma acoustic mode leads to the quasiparticle (plasmaron) that is the self-localized electron in the polarization well.

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