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Effect of electron correlation in nanotubes: electron localization RUSSELL SELVA, ANDREW KINCHEN, YURIY MALOZOVSKY, Southeastern Louisiana University — We study the electron correlation in the zigzag and armchair carbon nanotubes (CNT). We derived the dynamic pair interaction potential between two electrons in the tubule incorporating short-range and exchange correlation. Dispersion of plasmon modes at different values of angular momentum, and chirality angle and single-particle excitations are derived as well. We find that the plasma modes are not Landau damped with 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 so-called plasmaron quasiparticle and self-localization of an electron in the polarization well.

Yuriy Malozovsky
Southeastern Louisiana University

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