Anomalous Correlations in Field Effect Transistors.

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Consistent theoretical models [1] that explore the characteristics of electronic transport in metal-molecule-type metal devices are widely used in architecture formed by trans-polyacetylene coupled to two metal electrodes, the device was able to capture all the physical characteristics that appear in the transmittance curves [2]. The present work investigates the properties of electronic transport with T-shaped geometry, the properties of electronic transport were investigated by means of analytical calculations based on the function of Green, on the equilibrium and the Function of Green of Non-Equilibrium (NEGF) both obtained through calculations, evolved in time through Heisenberg's equation of motion and Keldysh's formalism. In this work, we calculate the characteristics of current-voltage, transmittance and differential conductance of the system that describes the transport properties of electronic devices for individual molecules [3,4]. We specifically considered chains n = 1,2,3,4,5 and 6 weakly coupled atoms to contacts in T-shaped geometry as well as their generalization to N sites, in this way we verified that by increasing the number of sites, access bands of energies which can be available to obtain tunneling with greater ease, improving the conductance. The system presented proved satisfactory for detecting common fermions (electrons) and consequently field effect transistors, provided that the coupling parameters are tuned properly.

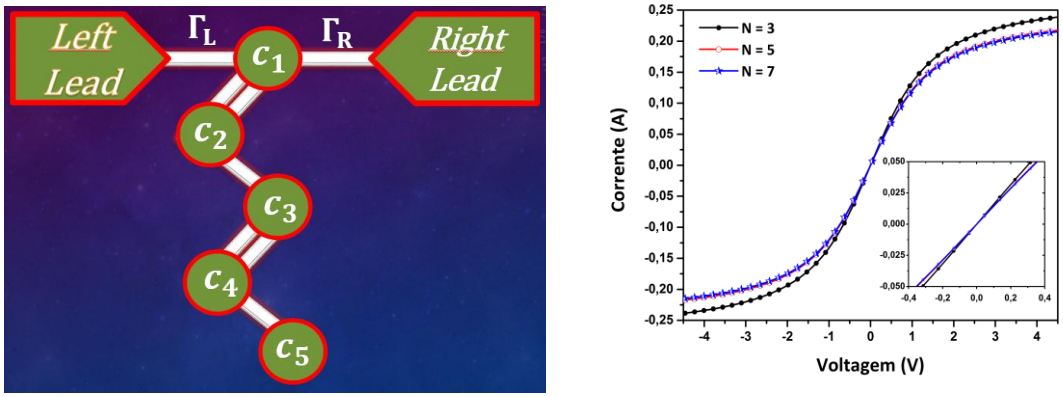

Figure 1: The left, Polyacetylene Polymer coupled to the metal electrodes, here we show the molecule with 5 sites. Right Electrical current for 3, 5, and 7 sites.

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