BAND STRUCTURE OF CNT EFFECT ON THE CNTFET PERFORMANCES

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ABSTRACT

Carbon nanotubes (CNT) has been seen as a potentially future material to provide an ultra small device by their exceptional electronic, optical, thermal, and mechanical properties, make them a promising candidate for applications in micro and nanoelectronics (essential in an application type transistor CNTFET (Carbon Nanotube Field Effect Transistor)). Using the available models, we simulated and analyzed the influence of the band structure of carbon nanotube on the device characteristics. Also in this paper, We present analytical modelling of the effective densities of states for the conduction and valence bands of a zigzag single-walled semiconducting carbon nanotube field effect transistor (CNFET) using the dispersion relation E(k) (the three first sub band) of the band structure of the carbon nanotube can be obtained by zone-folding approximation. In order to show the influence of the three first sub-band energy on DOS (Density Of State) of CNTFET.

KEYWORDS: Band Structure, Carbon Nanotube, Density of State, CNTFET, Zone Folding