

Abstract Submitted  
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**Detection of DNA nucleotides by investigating the changes of electric field in the channel of opened quantum system** NAHID KHADEMPAR, Department of Electrical Engineering, Sepidan Branch, Islamic Azad University, sepidan, iran, MASOUD BERAHMAN, School of Electrical and Computer Eng, Shiraz University, Shiraz, Iran, ARASH YAZDANPANAHI GOHARRIZI, Department of Electrical Engineering, Shahid Beheshti University, Tehran, Iran — In the current paper the chemisorbed DNA nucleotides to a graphene sheet placed between two gold electrodes in a contact-channel-contact system were investigated. The changes of electric field in the channel were distinguished to detection of DNA nucleotides. We used the non-equilibrium Green's function combined with the Density Functional Theory to analyze the system. The Mulliken population was deciphered for graphene and nucleobases. Some other parameters in this method such as the image plane which is in close accordance with the position of the peak of induced density, the projection plot of electron difference density and electrostatic difference potential of nucleotides were extracted. In this study, the nucleotides were rotated around the z-axis from 0 to 180 in steps of 20, and the isosurface plot of electron difference density of nucleotides and electron difference potential of nucleotides were shown. The qualitative and quantitative differences among these mentioned parameters were considered as yardstick to identify DNA nucleotides. Single layer graphene which is only one-atom-thick is an excellent electrical conductor with good electronic conductivity. Here we used the graphene as a biosensor. High accuracy obtained using this method is a plus point

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