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Single layer graphene sheet-based nanoelectromechanical resonator as mass detection

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Mass detection of molecules using single layer graphene sheet is investigated in the present paper. A nanoelectromechanical system resonator device is proposed which is modeled as Single Layer Graphene coupled to electronic transport through such device via two metallic leads. The conductance of such device is deduced by solving Eigen value differential equation. The influence of both photon energy of an induced ac-field and magnetic field are taken into consideration. The present results show that both the resonant frequency shift and the quality factor are very sensitive to mass consideration. Also, the photon energy of the induced ac-field enhances the sensitivity of these parameters. The present research is very important for detecting the mass of both chemical and biomolecules.

Biography

Aziz N Mina , Professor of theoretical physics at Beni Suef University in Egypt, Faculty of Science, Department of Physics. He received his Ph.D, in theoretical physics from Cairo University in Egypt 1995. He also worked as part time in American University in Cairo (1990-2000) and Misr International University in Egypt (2002- Now). His field of research in Symmetry Groups in Physics and Theory of High Tc Superconductivity. Now His work in Nanotechnology, Mesoscopic Devices, Quantum Transport in Quantum Dot, Spinotronics, Nanostructure and Naomaterials, Carbon Nanotube and Graphene.

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