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Detection of Molecular Mechanics on Graphene surface: An Electromechanical Logic Device KABEER JASUJA, NIHAR MOHANTY, VIKAS BERRY, Kansas State University — The integration of molecular mechanics with electronics is a promising route for building molecular electromechanical devices, nano machines and actuating nano circuits. In this talk, we demonstrate the effect of molecular mechanics of a monolayer of two azo-molecules attached to a graphene surface on the electrical properties of the azo-graphene device. We show that the reversible, photo-induced conformational change of the azo-molecule on graphene surface redistributes the fermionic density on graphene *via* the motion of the electron-rich benzene moiety of the azo molecules. Further, increasing the proximity of the electron cloud of the azo group's benzene ring increases the hole density of the graphene-azo hybrid. The carrier confinement and the high density of pi-electrons on graphene enable the sensitive detection of this molecular motion of the azo-monolayer. These results indicate the potential of graphene as a responsive coupling medium, which is sensitively influenced by molecular-scale mechanics. The research will potentially lead to development of novel graphene based molecular electromechanical systems.

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