Molecular Dynamics Simulation on Nanoelectromechanical Graphene Nanoflake Shuttle Device

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Abstract : We investigated the dynamic properties of graphene-nanoribbon (GNR) memory encapsulating graphene-nanoflake (GNF) shuttle in the potential to be applicable as a non-volatile random access memory via molecular dynamics simulations. This work explicitly demonstrates that the GNR encapsulating the GNF shuttle can be applied to nonvolatile memory. The potential well was originated by the increase of the attractive vdW energy between the GNRs when the GNF approached the edges of the GNRs. So the bistable positions were located near the edges of the GNRs. Such a nanoelectromechanical non-volatile memory based on graphene is also applicable to the development of switches, sensors, and quantum computing.