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Tunable Magnetic Proximity Effects in Graphene Junctions
1 PRE-DRAG LAZIC, Department of Physics, University at Buffalo, State University of New York, Buffalo, New York 14260, USA, KIRILL BELASHCHENKO, Department of Physics and Astronomy University of Nebraska-Lincoln, Lincoln, NE 68588-0299, USA, IGOR ZUTIC, Department of Physics, University at Buffalo, State University of New York, Buffalo, New York 14260, USA — The characteristic length of the magnetic proximity effects exceed the thickness of a graphene layer leading to an important, but typically overlooked, modifications of equilibrium and transport properties, as well as the implications for graphene spintronics [1,2]. Using the first-principles studies that integrate a real space density functional theory (GPAW) [3] with the state-of-the art boundary elements electrostatic code based on the Robin Hood method [4], we explore tunable electronic structure and magnetic proximity effects in the ferromagnet/insulator/graphene junctions. We show that the inclusion of a finite-size gate electrodes and van der Walls interaction lead to nontrivial effects that could also be important in other two-dimensional materials beyond graphene.


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