Abstract Submitted
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Tunable Magnetic Proximity Effects in Graphene Junctions[1] PREDRAG 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.

[1] P. Lazic et al., Phys. Rev. B 89 085429 (2014).
[2] W. Han et al., Nature Nanotech. 9, 794 (2014).
[3] J. Enkovaara et al., J. Phys. Cond. Matter 22, 253202 (2010).
[4] P. Lazic et al., J. Comp. Phys. 213, 117 (2006).

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