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Tailoring spin injection and magnetoresistance in ferromagnet/graphene junctions from first principles[1] PREDRAG LAZIC, Rudjer Boskovic Institute, Zagreb, Croatia, GUILHERME SIPAHI, University at Buffalo/Universidade de Sao Paulo, Brazil, ROLAND KAWAKAMI, University of California, Riverside, IGOR ZUTIC, University at Buffalo — Recent experimental advances in graphene [1-3] suggest intriguing opportunities for novel spintronic applications which could significantly exceed the state-of-the art performance of their conventional charge-based counterparts[4,5]. However, for reliable operation of such spintronic devices it is important to achieve an efficient spin injection and large magnetoresistive effects. We use the first principles calculations to guide the choice of a ferromagnetic region and its relative orientation to optimize the desired effects. We propose structures which could enable uniform spin injection, one of the key factors in implementing scalable spintronic circuits. [1] C. Josza and B. J. van Wees, Graphene Spintronics, in Handbook of Spin Transport and Magnetism, edited by E. Y. Tsymbal and I. Zutic (CRC Press, New York, 2011). [2] W. Han et al., Phys. Rev. Lett. **102**, 137205 (2009). [3] W. Han, K. Pi, K. M. McCreary, Y. Li, Jared J. I. Wong, A. G. Swartz, and R. K. Kawakami, Phys. Rev. Lett. **105**, 167202 (2011). [4] H. Dery, H. Wu, B. Ciftcioglu, M. Huang, Y. Song, R. Kawakami, J. Shi, I. Krivorotov, I. Zutic, and Lu J. Sham, IEEE Trans. Electron Devices 59, 259 (2012). [5] H. Dery et al., Proc. of SPIE **8100**, 81000W (2011)

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Igor Zutic
University at Buffalo

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