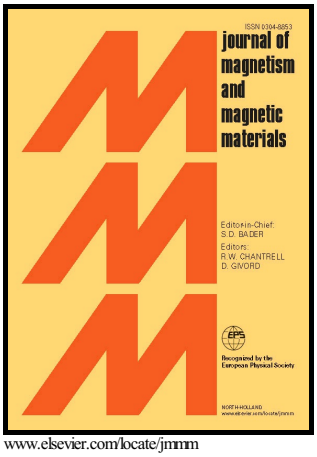

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PII: S0304-8853(16)33252-8
DOI: http://dx.doi.org/10.1016/j.jmmm.2017.01.059
Reference: MAGMA62407

To appear in: *Journal of Magnetism and Magnetic Materials*

Received date: 2 December 2016
Revised date: 4 January 2017
Accepted date: 17 January 2017

Cite this article as: Muhammad Zahir Iqbal, Ghulam Hussain, Salma Siddiqu and Muhammad Waqas Iqbal, Enhanced magnetoresistance in graphene spi valve, *Journal of Magnetism and Magnetic Materials* http://dx.doi.org/10.1016/j.jmmm.2017.01.059

Enhanced magnetoresistance in graphene spin valve

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Abstract

Graphene has been explored as a promising candidate for spintronics due to its atomically flat structure and novel properties. Here we fabricate two spin valve junctions, one from directly grown graphene on Ni electrode (DG) and other from transferred graphene (TG). The magnetoresistance (MR) ratio for DG device is found to be higher than TG device i.e. ~0.73 % and 0.14 %, respectively. Also the spin polarization of Ni electrode is determined to be 6.03 % at room temperature in case of DG device, however it reduces to 2.1 % for TG device. From this analysis, we infer how environmental exposure of the sample degrades the spin properties of the magnetic junctions. Moreover, the transport measurements reveal linear behavior for current-voltage (I-V) characteristics, indicating ohmic behavior of the junctions. Our findings unveil the efficiency of direct growth of graphene for spin filtering mechanism in spin valve devices.