Abstract Submitted
for the MAR13 Meeting of
The American Physical Society

Magnetic properties and spin transport in hybrid boron-nitrogen-carbon nanoribbons with transitional metal impurities[1] GEORGE ALEXANDRU NEMNES, TUDOR LUCA MITRAN, ADELA NICOLAEV, University of Bucharest, Faculty of Physics, "Materials and Devices for Electronics and Optoelectronics" Research Center, CAMELIA VISAN, Horia Hulubei National Institute of Physics and Nuclear Engineering, The Department of Computational Physics and Information Technologies, LUCIAN ION, STEFAN ANTOHE, University of Bucharest, Faculty of Physics, "Materials and Devices for Electronics and Optoelectronics" Research Center — We investigate the spin filtering effects in graphene nanoribbons, where inclusions of hexagonal boron nitride were introduced together with substitutional transitional metal impurities. It was established recently [1] that boron nitride sheets with substitutional manganese impurities can be a strong candidate for future low dimensional diluted magnetic semiconductors. Our first principle approach based on non-equilibrium Green's functions gives the polarization of the spin current for different structures and biases [2]. Several spin configurations of the magnetic impurities are considered, revealing different behaviors in the spin resolved current. Some key aspects regarding spin switching effects, i.e. the turning on and off the net spin current at different biases, are also discussed. The experimental availability of the building blocks – hybrid boron-nitrogen-carbon (BNC) materials – as well as the magnitudes of the obtained spin current polarizations indicates a strong potential of the analyzed structures for future spintronic devices. [1] T.L. Mitran, Adela Nicolaev, G.A. Nemnes, L. Ion, S. Antohe, J. Phys.: Condens. Matter 24, 326003 (2012) [2] G.A. Nemnes, Journal of Nanomaterials, 748639 (2012); doi:10.1155/2012/748639

[1]PN-II-RU-PD-2011-3-0044

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Date submitted: 04 Dec 2012 Electronic form version 1.4