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Large Magnetoresistance of MnBi/Bi/MnBi Spin Valve NABIL AL-AQTASH, University of Nebraska at Omaha , KHALDOUN TARAWNEH, Princess Sumaya University for Technology, Amman, Jordan, RENAT SABIRIANOV , University of Nebraska at Omaha — Recently, a large transport spin polarization was demonstrated in MnBi films by Andreev reflection experiments [1]. Furthermore, a large magnetoresistance (MR) of 70% was observed in MnBi junctions at room temperature [2]. Because of this, a spin-valve MnBi/Bi/MnBi device is promising to have large MR that can be controlled by the varying the thickness of Bi spacer. Thin films of Bi show a semimetal-semiconductor transition at reduced thicknesses. Bismuth itself shows a substantial MR and a large mean free path of electron. In this system both the electrodes and the spacer have a hexagonal unit cell. A transport magetoresistance of MnBi/Bi(6 layers)/MnBi film was calculated using density functional theory coupled with nonequilibrium Green's function method as implemented in SIESTA code. The calculations display a high transport spin polarization of MnBi. A transmission MR of the spin valve around 77% is calculated, consistent with the previous experimental observation of a large magnetoresistance in MnBi contacts. Thus, MnBi is promising candidate for high MR devices with tunable spacer properties. [1] P. Kharel, P. Thapa, P. Lukashev, R. F. Sabirianov, E. Y. Tsymbal, D. J. Sellmyer, and B. Nadgorny, Phys. Rev. B 83, 024415 (2011) [2] E. Clifford, M. Venkatesan and J. M. D. Coey, J. Mag. Magn. Mater. 272-276, 1614(2004).

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