

Abstract Submitted
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Lateral spin injection and detection through electrodeposited Fe/GaAs interfaces¹ SARMITA MAJUMDER, ANTHONY ARROTT, KAREN KAVANAGH, SFU, ANTHONY SPRING THORPE, CMC, SFU TEAM, CMC COLLABORATION — We report results on spin injection and detection through epitaxial, electrodeposited Fe/GaAs tunnel barriers formed ex-situ on epitaxially grown GaAs (001). The BCC-Fe films are predominantly single crystalline with large mosaic spread [1]. Tunnel junctions, fabricated with bulk GaAs wafers, and epitaxially grown MBE or MOCVD GaAs (001), showed the expected increase in tunneling current with increasing surface Si dopant concentration. Spin transport through in situ coherently strain, MBE Fe/GaAs interfaces have been reported at spin polarization levels as high as 42% at 50K.[3]. In our experiments the design of the epitaxially grown GaAs substrates followed those used successfully for in situ MBE Fe spin contacts. [2]. A spin voltage (4 mV) has been detected for $2 \times 10^{18}/\text{cm}^3$ doped tunnel junctions at liquid nitrogen temperatures (77 K) using an injection current of 20 A/cm² while varying the applied in-plane magnetic field (± 300 Gauss) along a $\langle 100 \rangle$ easyaxis of the Fe contacts. 1. Z. L. Bao, S. Majumder, A. A. Talin, A. S. Arrott, K. L. Kavanagh, JES 155 (2008) H841. 2. X. Lou, C. Adelman, A. S. Crooker, E. S. Garlidi, J. Zhang, K. S. Reddy, S. D. Flexner, C. J. Palmström, and P.A. Crowell, Nature Phys. 3 (2007) 197.

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