Abstract Submitted
for the NWS09 Meeting of
The American Physical Society

Analysis of electrodeposited Fe GaAs (110) interfaces using Atom Probe Tomography[1] SARMITA MAJUMDER, CHAO LIU, GIANMARCO SPIGA, SAVANNA SHAW, Simon Fraser University, CLIVE JONES, PROSA TY, PETER CLIFTON, TOM KELLY, Imago Scientific Instruments Corp., KAREN KAVANAGH, Simon Fraser University — Spin-polarized electron injection at magnetic-metal semiconductor interfaces have been demonstrated for epitaxial Fe-GaAs (100).[1, 2] fabricated via ultra-high vacuum deposition techniques, MBE. We fabricated similar epitaxial Fe-GaAs interfaces by electrodeposition using aqueous electrolyte solutions.[3] The structural abruptness of this electrodeposited interface have been investigated by cross-sectional transmission electron microscopy [4, 5] and by high resolution x-ray diffraction. Spin transport is being investigated. This report concerns our further investigations of the purity and compositional abruptness of these interfaces by Atom Probe Tomography (APT). The potential capability of APT is the atom by atom mapping of the atomic composition and location of each atom in a nanowire–like volume of material including the interface. Preliminary results confirm that electrodeposited Fe-GaAs is atomically abrupt with undetectable levels of impurities including S, C, or O. We expect spin transport at these interfaces to be equally efficient as those prepared in vacuum. [1] Lebeau, *et al APL* 93, 121909 (2008). [2] S. A. Crooker, *et al Sci.* 309 (2005) 2191. [3] Z. L. Bao, K. L. Kavanagh, *J. Appl. Phys.* (2005) [4] Z.L. Bao, *et al, J. Electrochem. Soc.* 155 (2008) H841. [5] S. Majumder, A. Arrott, K. L. Kavanagh, *J. Appl. Phys.* (2009)

[1]NSERC; Imago Scientific Instruments Corp.

Sarmita Majumder
Simon Fraser University

Date submitted: 10 Apr 2009 Electronic form version 1.4