

Abstract Submitted
for the MAR08 Meeting of
The American Physical Society

Measuring Spin Dependent Hot Electron Transport Using Spin-Polarized Ballistic Electron Emission Microscopy VINCENT LABELLA, The University at Albany, ANDREW STOLLENWERK, Harvard University, JOHN GARRAMONE, EVAN SPADAFORA, ILONA SITNITSKY, JOSEPH ABEL, The University at Albany — Spin polarized ballistic electron transport has been studied in Fe/Si(001) Schottky diodes using ballistic electron emission microscopy. Spin dependent scattering of polarized ballistic electrons injected from an Fe coated Au tip into the Fe films has been shown to affect the BEEM current. The spin dependent attenuation lengths were determined by measuring this effect with Fe thickness and found to be 1.8 ± 0.2 nm for the minority spin electrons and 2.5 ± 0.3 nm for the majority spin electrons at a tip bias of 1.5 eV. In addition, the attenuation lengths were measured as a function of tip bias, which indicated that the Fe/Si(001) interface band structure has an effect on the hot electron transport through the diode. Applications of the SP-BEEM technique to other systems will also be discussed.

Vincent LaBella
The University at Albany

Date submitted: 05 Dec 2007

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