

Abstract Submitted
for the MAR09 Meeting of
The American Physical Society

Spontaneous Loss of Spin Coherence in GaAs/Si Heterostructure¹ GUANGLEI CHENG, PATRICK IRVIN, Department of Physics and Astronomy, University of Pittsburgh, BIQIN HUANG, IAN APPELBAUM, Department of Physics, University of Maryland, JEREMY LEVY, Department of Physics and Astronomy, University of Pittsburgh — We present a possible way to optically inject spins into silicon. In this work, GaAs and Silicon-on-Insulator (SOI) wafers are bonded together by an ultrathin Ag layer using UHV wafer bonding. Standard optical pump-probe Kerr microscopy technique is applied to examine the spin coherence in the GaAs/Si heterostructure. In some areas of the bonded wafer, a relatively long spin coherence time of $T_2^*=0.5$ ns is observed in the GaAs. In other parts of the sample, the spin coherence is observed to decay much more rapidly ($T_2^*=140$ ps). One possible explanation is that the quality of the bond varies across the wafer and that the strongly bonded areas exhibit spin transport from GaAs to silicon.

¹This work is supported by NSF Materials World Network DMR-0602846.

Guanglei Cheng
Department of Physics and Astronomy, University of Pittsburgh

Date submitted: 21 Nov 2008

Electronic form version 1.4