Abstract Submitted
for the MAR08 Meeting of
The American Physical Society

Measurements of spin diffusion length in gold with point contact Andreev reflection spectroscopy MUHAMMAD FAIZ, RAGHAVA PANGULURI, Physics and Astronomy Department - Wayne State University, BENJAMIN BALKE, SABINE WURMEHL, CLAUDIA FELSER, Johannes Gutenberg-Universität, Germany, ANDRE PETUKHOV, Physics Department - South Dakota School of Mines and Technology, BORIS NADGORNY, Physics and Astronomy Department - Wayne State University — Spin diffusion length, L_s, is of fundamental importance for spin dependent transport and spintronic devices. So far, most of the measurements of L_s in non-magnetic metals have been done in the lateral non-local geometry, with the chemical potential difference characterizing the spin imbalance. In our approach the spin diffusion length was measured directly with point contact Andreev reflection spectroscopy. A spin polarized current was injected from a ferromagnetic electrode, $Co_2Mn_{0.5}Fe_{0.5}Si$ Heulser alloy, into Au films of variable thickness. The spin current, which gradually decays with the increased thickness of the film, was measured with a superconducting Nb tip. We developed a phenomenological theory which allowed us to determine the values of L_s in such a system. We found L_s to be on the order of 250 nm at 4 K, comparable to the results obtained by other techniques. Similar results were obtained with a Gd single crystal.

Muhammad Faiz
Physics and Astronomy Department - Wayne State University

Date submitted: 29 Nov 2007 Electronic form version 1.4