Abstract Submitted
for the MAR07 Meeting of
The American Physical Society

Ballistic Anisotropic Magnetoresistance in Electrodeposited Co Nanocontacts[1] ANDREI SOKOLOV, CHUNJUAN ZHANG, EVGENY Y. TSYMBAL, JODY REDEPENNING, University of Nebraska-Lincoln, EVGENY KIRIRANOV, Lincoln South-West High School, BERNARD DOUDIN, Institut de Physique et de Chimie des Matériaux de Strasbourg — As dimensions of a metallic conductor is reduced, spin-dependent conductance quantization in units of e^2/hleads to unusual magnetoresistive phenomena. One of them is ballistic anisotropic magnetoresistance (BAMR), a quantized change in the ballistic conductance according to the direction of magnetization. Here we present a first observation of BAMR in Co electrodeposited nanocontacts by *in-situ* investigation of their spin-dependent transport properties. We compare the results from electrochemically synthesized and break junction contacts. By measuring the conductance as a function of the applied magnetic field direction at saturation, we find the step-wise variation of the ballistic conductance, signature of the BAMR effect. Our results show that BAMR can be positive and negative, and have symmetric and asymmetric angular dependence. This behavior is explained using a simple tight-binding model in terms of the effect of the spin-orbit interaction on the electronic band structure of nanocontacts.

[1]Supported by the Nebraska NRI and the NSF through the MRSEC Program, DMR and CHE depts.

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Date submitted: 03 Dec 2006 Electronic form version 1.4