Abstract Submitted
for the MAR12 Meeting of
The American Physical Society

Electronic States of Nickel Effected By Magnetic Doping KEN PODOLAK, JAMIE SMITH, SUNY Plattsburgh — Spin currents have a great potential to replace charge currents. This would revolutionize how we read/write information. The generation and switching of spin currents however must be well understood. Transport measurements suggest that magnetic impurities can alter the mean free path of carriers and thereby create spin currents. Angle-resolved photoemission is used to determine the change in the electronic states of Ni induced by doping with iron, chromium, and manganese near the Fermi Energy. The samples were single crystals of nickel(110) with variable amounts of dopant diffused into it. Alloy single crystals were used over epitaxial thin films due to the sharper features at the Fermi Energy that they produced. The mean free path, magnetic splitting, and carrier density are affected by a few percent of each of the dopants. Iron suppresses the mean free path of minority spins only, while chromium and manganese suppresses both spins and decreases the magnetic splitting. The strong variation of these affects from one impurity to the other supports the concept of tailoring spin transport by magnetic doping. [1] K. N. Altmann et al., Phys. Rev. Lett. **87**, 137201 (2001) [2] K.R. Podolak, Ph.D. Thesis, Penn. State (2008)

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Date submitted: 26 Nov 2011 Electronic form version 1.4