Abstract Submitted
for the MAR08 Meeting of
The American Physical Society

Spin-polarized tunneling study of the room temperature spin filter CoFe2O4[1] ANA RAMOS, JEAN-BAPTISTE MOUSSY, DSM/DRECAM/SPCSI, CEA Saclay, France, RICHARD MATTANA, Unié Mixte de Physique, CNRS/Thales, Palaiseau, France, FREDERIC PETROFF, Unité Mixte de Physique, CNRS/Thales, Palaiseau, France, TIFFANY SANTOS, Argonne National Laboratory, Argonne, IL, USA, GUO-XING MIAO, JAGADEESH MOODERA, Francis Bitter Magnet Lab, MIT, Cambridge, MA, USA — The spin filter effect has the potential of generating highly spin-polarized electron currents by the spin selective transport of electrons across a ferromagnetic tunnel barrier. In this work, we investigate the spin-polarized tunneling characteristics of cobalt ferrite (CoFe2O4), which we show is a room temperature spin filter. Tunnel junctions containing epitaxial CoFe2O4(111) tunnel barriers have been grown by oxygen plasma-assisted molecular beam epitaxy. Their structural, chemical and magnetic properties having previously been optimized by a number of in situ and ex situ methods, we focus on the spin-polarized tunneling in the CoFe2O4-based systems using different measurement techniques. Following the demonstration of spin filtering by TMR measurements, both at low temperature and at room temperature, we further investigate the spin filter characteristics of CoFe2O4 in detail. In particular, we pay special attention to the influence of defects on the spin polarization, as well as the role of different spin-detecting electrodes.

[1]Funded by CNANO Ile de France and the MIT-France Program

Ana Ramos
DSM/DRECAM/SPCSI, CEA Saclay, France

Date submitted: 13 Dec 2007 Electronic form version 1.4