Abstract Submitted
for the MAR05 Meeting of
The American Physical Society

Dependence of giant tunneling magnetoresistance in MgO based magnetic tunnel junctions on the structure of Co electrodes SEE-HUN YANG, MAHESH SAMANT, STUART PARKIN, IBM ALMADEN RESEARCH CENTER TEAM — The giant tunneling magnetoresistance recently reported at room temperature in magnetic tunnel junctions (MTJs) with crystalline MgO(100) barriers is related to the bcc structure and (100) orientation of the Co-Fe ferromagnetic electrodes[1]. We have investigated the relationship between the tunneling magnetoresistance of MTJs with ultra-thin Co layer thicknesses inserted between the CoFe and MgO barrier layers and the structure of the Co layer. The electronic structure of the Co layers was studied with x-ray emission spectroscopy (XES) and near edge x-ray absorption fine structure (NEXAFS). The structure of these layers was studied using x-ray scattering. The magnitude of the TMR effect is found to be correlated with the structure of the Co layers. [1] S. S. P. Parkin, C. Kaiser, A. Panchula, P. M. Rice, B. Hughes, M. Samant, S.-H. Yang, Nature Materials, in press (2004).

See-Hun Yang
IBM Almaden Research Center

Date submitted: 07 Dec 2004 Electronic form version 1.4