

Abstract Submitted
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High sensitivity of tunneling spin polarization to chemical bonding of transition metal ferromagnetic alloys at interface with insulating barrier SEE-HUN YANG, HYUNSOO YANG, CHRISTIAN KAISER, STUART PARKIN, IBM Almaden Research Center, IBM ALMADEN RESEARCH CENTER TEAM — We report that the tunneling spin polarization (TSP) is found to be strongly influenced by the amount of oxygen used in the deposition of the tunnel barrier itself that chemical bonding at the interface between Al_2O_3 and ferromagnetic Co and Co-Pt alloys. For reactive sputter (RS) deposition of alumina using an argon-oxygen gas mixture with a low concentration of oxygen (~ 0.1 mTorr), much lower TSP values are found than when the alumina barrier is formed by post-plasma oxidation (PO) with ~ 100 mTorr oxygen of Al layers. X-ray absorption spectroscopy (XAS) has been used to characterize the chemical bonding at the Co or Co-Pt/ Al_2O_3 interface. These studies show that Co-O bonds are much more formed for the barrier formed by PO of Al than for that formed by RS deposition. We attribute the changes in TSP to changes in the relative tunneling probabilities from Co and Pt which are strongly influenced by oxygen bond formation.¹ ¹C. Kaiser, S. van Dijken, S.-H. Yang, H. Yang, and S. S. P. Parkin, Phys. Rev. Lett. 94, 247203 (2005).

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