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Quantitative Depth Profiling of Interfacial Moments in Paramagnetic CoO in Py/CoO bilayer. SUJOY ROY, X. LIU, S.K. SINHA, B.J. TAYLOR, M.B. MAPLE, Y. TANG, JUNG-IL HONG, A.E. BERKOWITZ, University of California-San Diego, T. LEO, D.J. SMITH, Arizona State University, Tempe, S. PARK, M.R. FITZSIMMONS, Los Alamos National Lab, C. SANCHEZ-HANKE, C.-C KAO, NSLS, Brookhaven National Lab — We have employed soft x-ray resonant magnetic reflectometry to determine the depth dependence of the net ferromagnetic moment in a Permalloy/CoO bilayer *above* the Néel point of the antiferromagnetic CoO at 300K. *Quantitative element specific* depth dependent charge and magnetization density profiles have been determined by analyzing the specular reflectivity data at the L_3 edges of Co and Ni using resonant magnetic scattering theory in the Distorted Wave Born Approximation. We have found that a thin interfacial layer with charge density different from either the Permalloy (Py) or CoO forms at the Py/CoO interface. This layer is magnetic even at room temperature and has a *different* temperature dependence of magnetization compared to Py. We have put the depth profile of magnetization in an *absolute scale* by combining the results of reflectivity measurements and SQUID magnetometry. Work of SKS and MBM supported by DOE.

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