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.