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**Magnetic Order In Metallic Copper Induced By Proximity To Cobalt: A Detailed X-Ray Spectromicroscopy Study** HENDRIK OHLDAG, SLAC National Accelerator Laboratory, ZHAO CHEN, Stanford University, SOHRAB REDJAI SANI, ANDREW D. KENT, New York University, ROOPALI KUKREJA, ERIC E. FULLERTON, UC San Diego, STEFANO BONETTI, Stockholm University, TYLER CHASE, Stanford University, HERMANN DURR, JOACHIM STOHR, SLAC National Accelerator Laboratory — We observe localized, magnetic 3d Cu states in Co/Cu alloys using high resolution X-Ray Absorption Spectroscopy (XAS) and X-Ray Magnetic Circular Dichorism (XMCD) spectroscopy at the Copper L3 resonance. We show that increased Co concentration in our alloy leads to three spectroscopic effects consistent with these localized Cu states: (1) down-wards shift of the Cu L3 XAS peak by 0.5eV relative to the Cu L3 XMCD peak, resulting in the alignment of these two peaks, (2) nonlinear narrowing of the XAS peak, and (3) merging of the satellite d-to-s Cu L3 transitions peaks in both the XAS and XMCD channels. We compare our results to XAS spectra taken of multilayered samples, and show that our alloyed Cu atoms behave analogously to Cu atoms near a Cu/Co interface. Our results thus provide novel, key insight into the behavior of Cu when placed near a ferromagnetic interface, which is crucial for modern spintronics research where Cu is not only often used as a spacer in F/N/F multilayer devices, but also is often tuned to such low thicknesses that interfacial effects begin to dominate the physics. References: R. Kukreja et al., Phys. Rev. Lett. 115, 096601 (2015); M. G. Samant et al., Phys. Rev. Lett. 72, 1112 (1994); O. Karis et al., Phys. Rev. B 62, R16239 (2000); J. Stoehr and H. C. Siegmann, Magnetism: From Fundamental to Nanoscale Dynamics (Springer, 2006).

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