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Magnetic Spatial Profile Across a Molecular / Metal Interface J. SHOUP, University of South Florida, C. KINANE, S. LANGRIDGE, ISIS-STFC, F. AL MA'MARI, M. ROGERS, O. CESPEDES, Univ. of Leeds, B. KIRBY, J. BORCHERS, NCNR-NIST, D.A. ARENA, University of South Florida — The recent discovery of ferromagnetism originating at the interface between molecular carbon (C60) and diamagnetic or paramagnetic transition metals (TM) points to a new path for development of ferromagnetic materials. Muon spin resonance (μ-SR) confirms that the ferromagnetic spins originate at the C60/TM interface, but μ-SR can lack the depth resolution to localize the spins and determine the spin decay length away from the interface. We performed polarized neutron reflectometry (PNR) measurements on a C60/TM superlattice to attempt to determine the magnetic scattering length density (SLD) in our sample. A challenge in the PNR measurements is the extremely small bulk magnetization in the sample ($\leq$ 50 emu per cm^3 of Cu). At magnetic saturation the PNR spin asymmetry (SA), where SA = (S - S) / (S + S), exhibits a small oscillatory variation. The SA oscillation amplitude appears to track the sample magnetization; the SA measured at remanence over a smaller perpendicular momentum transfer (Q_z) range seems to converge towards zero. Modeling currently underway will combine structural parameters obtained from laboratory-based x-ray reflectivity (XRR) over a wide Q_z-range with the PNR results to arrive at a consistent structural / magnetic depth profile.

Dario Arena
University of South Florida

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