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Tunneling Studies of Superconductor/Strong Ferromagnet Bilayers PAUL SANGIORGIO, Stanford University, SERGE REYMOND, Université de Lausanne, MALCOLM BEASLEY, Stanford University, TESU KIM, JUNHYUNG KWON, KOOKRIN CHAR, Seoul National University — Thin-film heterostructures composed of superconductors and ferromagnets have recently received much interest, as they provide a unique opportunity to study the proximity effect between superconductivity and magnetism. We report systematic tunneling density of states (DOS) measurements on superconductor (Nb) /strong ferromagnet (CoFe, Ni) bilayers made with high quality aluminum-oxide planar tunnel junctions as a function of ferromagnetic thickness, d_F. In CoFe, we find that as d_F increases, the superconducting DOS exhibits a scaling behavior in which the deviations from the normal-state conductance have a universal shape, which decreases exponentially in amplitude. The decay length, d_1, is approximately 0.4 nm. We do not see oscillations in the DOS as a function of d_F, as one would expect from predictions based on the Usadel equations using reasonable parameters, although an oscillation in $T_c(d_F)$ has been seen in the same materials. Measurements on Nb/Ni bilayers will also be presented. This work is supported by AFOSR, DOE, and KOSEF through CSCMR.

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