

Abstract Submitted
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Tunneling DOS of Superconductor / Strong Ferromagnet Bilayers¹ PAUL SANGIORGIO, MALCOLM BEASLEY, Stanford University, SERGE REYMOND, Université de Lausanne, JUN HYUNG KWON, TESU KIM, KOOKRIN CHAR, Seoul National University — We report tunneling density of states (DOS) studies of superconductor (Nb) / strong ferromagnet (CoFe, Ni) bilayers along with quantitative comparisons with calculations made with the Usadel equation. Since both CoFe and Ni are quite strong ferromagnets, we expect theoretically that the DOS we observe as a function of ferromagnet thickness, d_F , should be similar. Instead, we find that the Nb/CoFe superconducting DOS exhibits a scaling behavior with a characteristic length of 0.4 nm, whereas the Nb/Ni superconducting DOS does not scale. Further, the Nb/Ni bilayers have a “double peak” DOS for $d_F = 1.5 - 3.0$ nm and for $d_F = 3.5 - 4.0$ nm, we report the first observation of an “inverted” DOS in a strongly ferromagnetic material. Various modifications to the basic Usadel equation will be compared to the experimental data.

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