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Possibility of p -wave triplet pairing in Nb/Ni bilayers WENJIAN LU, KOOKRIN CHAR, Center for Strongly Correlated Materials Research, Department of Physics and Astronomy, Seoul National University, Seoul 151-742, Korea, Y.K. BANG, Department of Physics, Chonnam National University, Kwangju 500-757, Korea, P. SANGIORGIO, Ecole Polytechnique Federale de Lausanne, Lausanne, Switzerland, M.R. BEASLEY, Department of Applied Physics, Stanford University, Stanford, CA 94305 — We have experimentally investigated the density of states (DOS) in Nb/Ni (S/F) bilayers and found the anomalous double peak structure. In order to analyze the measured DOS data, we propose a theory model in which p -wave triplet pairing correlations are induced by an inhomogeneous magnetization in the ferromagnet. The induced triplet component penetrates into the ferromagnet over a long length (much larger than a characteristic length scale $\xi_F = \sqrt{D/h}$, where D is the diffusion coefficient and h exchange energy). We numerically calculate the DOS of Nb/Ni bilayers based on Eilenberger equation with various parameters and discuss the unusual sub-gap structure in the DOS. We find a good qualitative and quantitative agreement between the model calculations and our measurements and therefore suggest the possibility of p -wave triplet correlations in Nb/Ni bilayers.

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