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Ferromagnetic Switching of Nb/Ni Multilayers and Trilayers in the Superconducting and Normal States[1] LANCE DE LONG, WEN-TAO XU, S. KRYUKOV, University of Kentucky, E. NAVARRO, J. VILLEGAS, E. GONZALEZ, JOSE VICENT, Universidad Complutense, UNIVERSITY OF KENTUCKY TEAM, UNIVERSIDAD COMPLUTENSE COLLABORATION —

Ni(y)[Nb(x)/Ni(y)]$_z$ multilayers (z = 5, 8) with x = 23, 10 nm and y = 2.5, 3.5, 5 nm, and Nb(x)/Ni(y)/Nb(x) and Ni(y)/Nb(x)/Ni(y) trilayers with x = 23, 200 nm and y = 5 nm, were investigated via SQUID magnetometry with magnetic field parallel to the film plane. The superconducting transition temperature T_c of samples was sometimes reduced well below 8 K, depending upon the Nb layer thickness x and the total number of Ni layers. Abrupt, reproducible switching anomalies are observed for multilayers, and complex magnetization curves observed for trilayers, in the superconducting state, instead of the smooth ferromagnetic hysteresis seen in the normal state. These results suggest that a complex magnetic coupling exists between Ni layers when mediated by Nb layers in the superconducting state.

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