

Abstract Submitted
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Checking for odd-triplet pairing using novel superconducting spin valves¹ PAVEL N. LAPA, Argonne National Laboratory, Texas A&M University, TRUPTI KHAIRE, JUNJIA DING, JOHN E. PEARSON, VALENTYN NOVOSAD, AXEL HOFFMANN, J.S. JIANG, Argonne National Laboratory — An excitation of odd-triplet pairing in a superconducting spin valve can be revealed by measuring the dependence of the superconducting critical temperature T_c with increasing non-collinearity of the magnetizations in adjacent ferromagnetic layers. A standard approach to create such a non-collinear magnetization configuration is to pin one ferromagnetic layers and control the magnetization in another layer by rotating the multilayer in a small magnetic field. Unfortunately, the rotation can modify the vortex current which also strongly affects the critical temperature. To exclude such spurious effects, we designed and fabricated a novel superconducting spin valve which allows us to create non-collinear magnetization configurations without using a sample rotator. The valve's operational principle is based on pinning of a synthetic antiferromagnet (SAF) by exchange coupling it to FeMn layer. The ability to imprint non-collinear magnetization configurations in the spin valve was confirmed using giant magneto resistance (GMR) measurements. The response of the magnetizations on an external magnetic field was simulated based on a coherent rotation model. The dependence of the Nb layer T_c on imprinted magnetization configuration will be presented.

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