

Abstract Submitted
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Odd-Triplet Superconductivity in SmCo/Py Exchange Spring Based Josephson Junctions¹ SAMUEL HEDGES, JIYEONG GU, Cal State Univ- Long Beach — In a Josephson junction, a superconducting wave function can leak into a non-superconducting layer. If this non-superconducting layer is a ferromagnet with a nonhomogeneous magnetization, the odd-triplet component of the superconducting wave function can be generated at the superconductor/ferromagnet interface. Samarium-Cobalt(SmCo)/Permalloy(Py) exchange springs are used to generate a nonhomogeneous magnetic layer in Niobium(Nb)-based Josephson junctions. In these junctions, the critical current and I-V curves are measured as a function of nonhomogeneity of the magnetic layer to search for direct evidence of the odd-triplet component. To understand how these properties vary, a single-domain junction is preferable, such that the supercurrent through the junction is uniform. The lack of a clear Fraunhofer pattern measured for the junctions produced indicates that smaller junction sizes are required to generate a uniform supercurrent. While the critical current and I-V curves were observed to vary with the nonhomogeneity of the magnetic layers, further measurements are required to indicate whether the observed behavior is consistent with the theory of odd-triplet superconductivity.

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