



Superconducting triplet spin valve

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We study the critical temperature T_c of SFF trilayers (S is a singlet superconductor, F is a ferromagnetic metal), where the long-range triplet superconducting component is generated at noncollinear magnetizations of the F layers.

We demonstrate that T_c can be a nonmonotonic function of the angle α between the magnetizations of the two F layers. The minimum is achieved at an intermediate α , lying between the parallel (P, $\alpha=0$) and antiparallel (AP, $\alpha=\pi$) cases.

This implies a possibility of a "triplet" spin-valve effect: at temperatures above the minimum T_c^{Tr} but below T_c^{P} and T_c^{AP} , the system is superconducting only in the vicinity of the collinear orientations. At certain parameters, we predict a reentrant $T_c(\alpha)$ behavior. At the same time, considering only the P and AP orientations, we find that both the "standard" ($T_c^{\text{P}} < T_c^{\text{AP}}$) and "inverse" ($T_c^{\text{P}} > T_c^{\text{AP}}$) switching effects are possible depending on parameters of the system.