



Moscow International Symposium on Magnetism

1 – 5 July 2017

# Book of Abstracts

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## Main Topics

Spintronics and Magnetotransport  
Magnetophotonics  
High Frequency Properties and Metamaterials  
Magnetic Nanostructures and Low Dimensional Magnetism  
Soft and Hard Magnetic Materials  
Magnetic Shape-memory Alloys and Magnetocaloric Effect  
Magnetic Semiconductors and Oxides  
Multiferroics  
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Study of Magnetism using X-rays and Neutrons  
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## DISTRIBUTION OF PAIRING FUNCTIONS IN SUPERCONDUCTING SPIN-VALVES

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We investigate SF1F2 structures (S is a singlet superconductor, F1 and F2 are ferromagnetic metals, identical in our case), where the long-range triplet superconducting pairing is generated at canted magnetizations of the F layers [1]. An asymptotically exact numerical method [2] is employed here to calculate critical temperature  $T_c$  as a function of the trilayer parameters, such as mutual orientation of magnetizations, interfaces transparencies, and the layers thicknesses.

Previously it was demonstrated that transition temperature  $T_c$  in semi-infinite SF1F2 structures can be a non-monotonic function of the angle  $\alpha$  between magnetizations of the two F layers [3], against the monotonic  $T_c(\alpha)$  behavior obtained for the F1SF2 trilayers [4]. It was shown lately [5] the existence of the anomalous dependence of the spin-triplet pairing correlations on the angle  $\alpha$  in SF1F2 structures in a limit of thin F layers.

We examine comparatively the spin-singlet and spin-triplet pairing distributions and amplitudes as a function of the layers thicknesses at different values of the angle  $\alpha$  in SF1F2 structures to clarify which one of the pairings and how may impact on the superconducting spin-valve switching modes in these heterostructures.

Fig. 1 shows the spin-singlet, the short-range triplet with zero projection and the long-range triplet with  $\pm 1$  projections superconducting pairing components in the triplet spin-valve switching mode of the trilayer heterostructure.

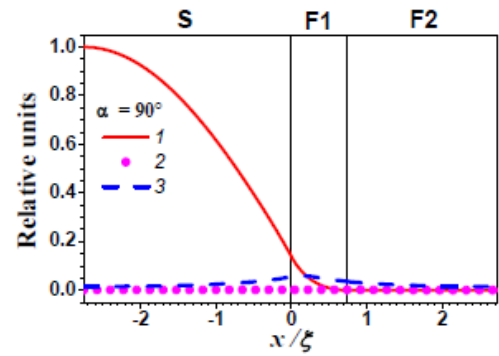


Fig. 1. Distribution spin-singlet (1), triplet with zero projection (2), triplet with  $\pm 1$  projections (3) superconducting pairing components at orthogonal orientation of magnetizations.

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