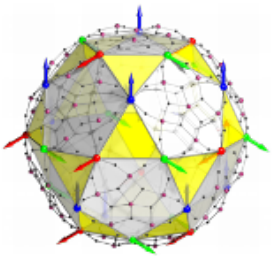

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Neutron studies of of [Fe(x)/Nb(1.5)]10/Nb(40nm) systems

Thursday, 6 June 2019 17:32 (1 minute)

Thin film heterostructures are one of the most prominent and studied systems for the realization of spintronics devices, due to the different magnetic couplings and proximity phenomena that are possible to obtain. One of the most well-known examples is the RKKY exchange coupling, that leads to Giant Magnetoresistance in ferromagnet/metal/ferromagnet layers, which is nowadays at the basis of modern spintronics. An interesting question to explore is what would happen to the coupling between ferromagnetic in the presence of superconducting correlations in the normal metal spacer.
In this work we report on preliminary results on the preparation and characterization of samples of composition Al2O3(1 -1 0 2)//Nb(40nm)/[Fe(x)/Nb(1.5nm)]$_{10}$/Pt(3nm), with x=2-4 nm, grown in DCA M600 MBE setup of JCNS. A Fe/Nb superlattice is deposited on top of a thick superconducting Nb(40nm) buffer layer, that acts as a reservoir of superconducting pairs which will be transferred to the superlattice using proximity effect [1]. The samples were studied with SQUID magnetometry, X-ray diffraction and depth sensitive polarized neutron reflectometry (PNR), which is proved to be a powerful method for the study of magnetic state of Fe/Nb superlattices [2].

1. S.V. Bakurskiy et al, JETP Letters 102 (9), 586-593 (2015)
2. Ch. Rehm, D, Nagengast, F. Klose, H. Maletta, A. Weidinger EPL 38 (1997)

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