MAGNETIC FIELD BEHAVOIR OF SUPERCONDUCTING HETEROSTRUCTURES WITH ANTIFERROMAGNETIC LAYER.

I.V. Borisenko[1], K.Y. Constantinian[1], P.V. Komissinkiy [1,2], <u>Y.V. Kislinskii</u>[1], G.A. Ovsyannikov[1], A.V. Shadrin[1]

[1]*Institute of Radio Engineering and Electronics, Mokhovaia st. 11 buiding 7, 125009, Moscow, Russia;*
[3]*Technical University of Darmstadt, D-64287, Germany*
e-mail: yulii@hitech.cplire.ru

A critical currents I_C versus magnetic field H for $Nb/Au/Ca_xSr_{1-x}CuO_2/YBa_2Cu_3O_7$ heterostructures (GSA) with antiferromagnetic thin film layer (A) of $Ca_xSr_{1-x}CuO_2$ $20 \div 50$ nm in thickness were measured. It were compared with $I_C(H)$ dependencies for $Nb/Au/YBa_2Cu_3O_7$ Josephson junctions, which were made by similar technique and with the same sizes from $10 \cdot 10$ μm^2 to $50 \cdot 50$ μm^2. According to [1] GSA structures should have magnetic oscillations of I_C, which are much smaller in period, than period of $I_C(H)$ for SNS junctions, in case of A layer is thicker than coherence length. In figure 1 half widths of the main peak ΔH in dependency $I_C(H)$ are compared for GSA and for the junctions.
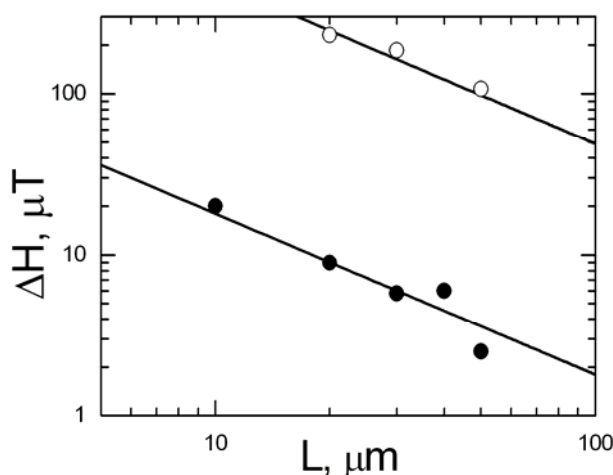
The ΔH fields for GSA with 50 nm $Ca_{0.5}Sr_{0.5}CuO_2$ layer (closed circles) were 25 times smaller, than the fields for junctions, which have no A layer (open circles). ΔH fields were inversely proportional to structure width L in both cases (solid lines). Sensitivity to magnetic field 2mV/G was obtained for $20 \cdot 20$ μm^2 heterostructure.

[1] L.P. Gorkov, V.Z. Kresin: Physica C, **367**, p. 103, (2002).

It is a poster presentation to section "Magnetism and superconductivity.