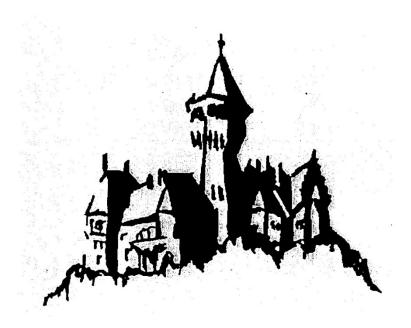
Kuprigahov

WEAK SUPERCONDUCTIVITY SYMPOSIUM

WSS96

Smolenice Castle, August 4-7,1996

SLOVAK REPUBLIC



Organized by:

Institute of Electrical Engineering Slovak Academy of Sciences Bratislava

Institut für Festkörperphysik Friedrich-Schiller-Universität Jena

HTSC Josephson junctions and dc SQUIDs on SrTiO₃ bicrystal substrates grown by floating zone method

A.M.Balbashov^a, I.Yu.Parsegov^a, E.K.Kov'ev^b, I.I.Vengrus^c, S.N.Polyakov^d, M.Yu.Kupriyanov^d and <u>O.V.Snigirev^c</u>

The new approach to the fabrication $SrTiO_3$ bicrystal substrates based on the technology of growing by floating zone method natural $SrTiO_3$ bicrystals with misorientation angles 24° and 37° has been developed. Thin film YBCO Josephson junctions and dc SQUIDs on $SrTiO_3$ bicrystal substrates were fabricated and studdied at T=77 K. The critical current density j_c and I_cR_n product for the junctions with misorientation angle $\alpha=24^\circ$ was about $2x10^4$ A/cm² and 190-260 μV respectively, while for $\alpha=37^\circ$ it was found that $jc\approx2x10^3$ A/cm² and $I_cR_n\approx90\text{-}120$ μV . dc SQUIDs were made with typical inductances 20-80 pH, critical currents of 20-150 μA and resulting voltage modulation 10-40 μV . Noise measurements performed at 77 K revealed low 1/f noise with cut-off frequency about 10 Hz.

The nature of stabilization of superconductivity by phase-slip centers in a narrow channel

V.M.Dmitriev, E.V.Khristenko, I.V.Zolochevskii

B. Verkin Institute for Low Temperature Physics & Engineering, National Acad. of Sci. of Ukraine, 47, Lenin Ave., Kharkov, 310164, Ukraine

The Tidecks hypothesis for the effect of Josephson radiation of phase slip centers on critical current in a superconducting channel is tested. It is found that the resistive states of superconducting channels with electromagnetic field applied are more stable to current than without any field. This phenomena is observed beginning with irradiation frequencies of the order of the inverse charge imbalance relaxation time.

^aMoscow Power Engeneering Institute, Moscow, Russia

^bCrystalography Institute Russian Academy of Science, Moscow, Russia

^cInstitute of Terrestrial Magnetism, Ionosphere and Radio Wave Propagation, Russian Academy of Science, Moscow district, 142092, Troitsk, Russia,

^dInstitute of Nuclear Physics, Moscow State University, 119899 GSP, Moscow, Russia

Department of Physics, Moscow State University, 119899 GSP, Moscow, Russia