9.7 cm

LONGITUDINAL MAGNETORESISTANCE IN SINGLE CRYSTAL WIRES OF PURE AND DOPED BISMUTH IN WIDE RANGE OF DIAMETERS

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The some regularities of manifestation of the galvanomagnetic size effect (GMSE) in the longitudinal magnetoresistance (LM) in thin Bi wires at variation of the energy spectrum parameters of the charge carriers by doping with acceptor and donor impurities and strong stretching are studied.

It was found that in weak magnetic fields the LM has 3 characteristic peculiarities: 1) the maximum presence at $r \sim d$ (r is the Larmor radius, d is the wire diameter), 2) the absence of LM, 3) sharp decrease of the resistance beginning from H=0. The maximum presence on the LM in weak magnetic fields is determined by availability and anisotropy of L-carriers, and its value $H_{max} = p_F c/ed$ for pure bismuth wires and the position depend on d/l ratio.

The region of strong magnetic fields is characterized by presence of the negative LM, its value $R(H) \approx H^{-1}$ in the case when 3 electron ellipsoids or hole ones participate in conductivity at L-point of the Brillouin zone, this corresponding to the GMSE.

The support from CRDF Grant No MR 2-3019 is gratefully acknowleged.

13.4 cm

Subject category :

2. Magnetic Films, Surfaces and Multilayers

Presentation mode :
poster

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