MAREA P9 **SEMIMETAL- SEMICONDUCTOR TRANSITION IN SEMIMETAL Bi-Sn AND $Bi_{1-x}Sb_x$ WIRES INDUCED BY DEFORMATION AND MAGNETIC FIELD**

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The best thermoelectric materials are believed to be doped semiconductors. Current research is aimed at increasing the thermoelectric figure of merit $ZT=\alpha^2\sigma/\chi*T$ by maximizing the power factor $\alpha^2\sigma$ and minimizing the thermal conductivity χ.

We report here the features of semimetal- semiconductor transition (SMSCT) in Bi-2at%Sb and Bi-0.02at%Sn nanowires, induced by the size quantization effect, magnetic field and strong (till 2%) elastic deformation in area 2.1-300K
Single- crystal Bi-2at%Sb и Bi-2at%Sn glass coated wires with different diameters from 100 nm to 1000 nm and (1011) orientations allong the wire were prepared by the Ulitovsky liquid phase casting method [1].

The change of the Fermi surface topology at Sn doping of the Bi and $Bi_{1-x}Sb_x$ wires and at the elastic deformation of 2% elongation was supervised by Shubnikov de Haas oscillations (SdH). It is shown that in the Bi-2at%Sb wires SMSCT due to the quantum size effect occurs at the diameters of the wires 5 times larger than in a pure bismuth, which is associated with a decrease in the overlap L and T bends, that is confirmed by calculations of position of the Fermy level L-electrons and T-holes from SdH.

It has been establish that SMSCT induced by a magnetic field and deformation are accompanied by a change in the sign of the thermopower and anomalies of the transverse magnetoresistance at low temperatures. Effects are interpreted in terms of both appearance supplemental channel scattering of carriers - electrons at the δ- correlated surface of the quantum wires and selective scattering channel L- carriers in T zone with a large density of states in the Bi-2at% Sn wires, which well agrees with the theoretical models quantum size effect [2] and Lifshitz electronic topological transitions [3].

Power factor $\alpha^2\sigma$ and its dependences on the diameter Bi-2at%Sb and Bi-0.02at%Sn nanowires, temperature, magnetic field and deformation were calculated.

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