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Mobility and thermopower of surface and bulklike charges in Bi and Sb nanowires[1] T.E. HUBER, Howard University, Washington, DC 20059, A. ADEYEYE, Howard University, Washington DC 20059, A. NIKOLAEVA, L. KONOPKO, Academy of Sciences of Moldova and International Laboratory of High Magnetic Fields and Low Temperature Physics, R.C. JOHNSON, M.J. GRAF, Boston College, Chestnut Hill, MA 02467 — Topological insulators (TI) surface charges are predicted to have high mobilities and other properties. Bi and Sb, that are classified as TI trivial and true, respectively, are interesting candidates but are not very good bulk insulators. However, in very thin nanowires, quantum confinement opens a gap for the bulk states that is not expected to change the material's TI character. We studied the electronic transport of 18-nm to and 200-nm diameter nanowires in arrays, fabricated by Bi injection in porous alumina, via coupled measurements of resistance and thermopower (4-300 K). Surface carriers and holes Landau level spectra were analyzed to extract densities. The nanowires low temperature thermopower (T<100 K) is -1 T microvolt/(K^2) consistent in sign and magnitude with surface electrons. Coexistence of bulklike holes with surface electrons, consistent with the carrier's hybridization that is expected in Bi, is observed. Results for Sb will be presented also.

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