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Quantum Confinement and Surface State Effects in the Thermopower of Bismuth Nanowires. T.E. HUBER, Howard University, A. NIKOLAEVA, Academy of Sciences. Moldova, D. GITSU, Academy of Sciences. Moldova, L. KONOPKO, Academy of Sciences. Moldova, M.J. GRAF, Boston College — Because of the increased density of states arising from one-dimensional confinement, it is anticipated that bismuth quantum wires will exhibit superior thermoelectric properties. Recently, angle-resolved photoemission spectroscopy (ARPES) studies have shown that Bi supports surface states that have not been considered in current models of quantum confinement. Studies of the Fermi surface, employing the Shubnikov-de Haas (SdH) method, in arrays of 30- to 80-nm bismuth nanowires partially corroborates ARPES findings. We have studied the thermopower of arrays of 50-nm Te- and Sn-doped Bi nanowires and we discuss these experimental results in terms of a Bi nanowire conduction model based on ARPES and SdH results..

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