

Abstract Submitted
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Surface Modification induced Double Decoupling in Transport Properties of Polycrystalline Bi JIAN HE, POOJA PUNEET, RAMAKRISHNA PODILA, SONG ZHU, MALCOLM SKOVE, TERRY TRITT, APPARAO RAO, Department of Physics and Astronomy, Clemson University, Clemson, SC, United States 29634 — Nanostructured thermoelectric (TE) materials have gained major interest due to their ability to offer better control of electronic and thermal transport properties. Such nanostructures, with increased surface-to-volume ratio, lead to pronounced surface effects on various transport properties. In this study, we used the spark plasma sintering (SPS) process as a densification and surface modification technique for nano-structured Bi. Several samples were prepared with varying the DC pulse times and durations to tailor interface/surface properties. As a result, a complete decoupling of electrical and thermal transport (*double decoupling*) in nano-structured Bi was observed with enhanced (greater than six-fold) power factor. This is a very significant improvement that goes beyond partial decoupling. Details of the TE properties will be presented.

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