Abstract Submitted for the MAR14 Meeting of The American Physical Society

The Effects Nano-Structuring, Form of Band Structure, Asymmetry of Band-Edges, and Scattering Mechanism for Enhancement on ZT SHUANG TANG, MILDRED DRESSELHAUS, Massachusetts Institute of Technology — Since 1993 when Hicks and Dresselhaus proposed that the low dimensional materials have enhanced ZT relative to their bulk counterparts, intensive research attention has been focused on enhancing the ZT in different materials, such as thin films, nanowires, nano-composites, etc. On the other hand, the proposal of bismuth antimony thin films in 2012, has provided a materials system with anisotropic and asymmetrical band edges, where both parabolic and non-parabolic forms of band structure exist. This raises a question on how can we enhance the figure of merit of thermoelectrics by using the special properties of these novel materials. This work will focus on exploring how the dimension, the form of band structure, the asymmetry and anisotropy of the band edges, and the electron scattering mechanism will influence the ZT.

Shuang Tang Massachusetts Institute of Technology

Date submitted: 14 Nov 2013 Electronic form version 1.4