

Abstract Submitted
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Large thermoelectric figure of merit for three-dimensional topological Anderson insulators via line dislocation engineering¹ OLEG TRETIAKOV, ARTEM ABANOV, Texas A&M University, SHUICHI MURAKAMI, Tokyo Institute of Technology, JAIRO SINOVA, Texas A&M University — We study the thermoelectric properties of three-dimensional topological Anderson insulators with line dislocations. We show that at high densities of dislocations the thermoelectric figure of merit ZT can be dominated by one-dimensional topologically protected conducting states channeled through the lattice screw dislocations in the topological insulator materials with a nonzero time-reversal-invariant momentum such as $\text{Bi}_{0.9}\text{Sb}_{0.1}$. When the chemical potential does not exceed much the mobility edge the ZT at room temperatures can reach large values, much higher than unity for reasonable parameters, hence making this system a strong candidate for applications in heat management of nanodevices.

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