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Thermoelectric efficiency of holey topological insulators¹ ARTEM ABANOV, OLEG TRETIAKOV, JAIRO SINOVA, Texas A&M University — We study the thermoelectric properties of three-dimensional topological insulators with many holes (or pores) in the bulk. We show that at high density of these holes the thermoelectric figure of merit, ZT , can be large due to the contribution of the conducting surfaces and the suppressed phonon thermal conductivity. The maximum efficiency can be tuned by an induced gap in the surface states dispersion through tunneling or external magnetic fields. The large values of ZT , much higher than unity for reasonable parameters, make this system a strong candidate for applications in heat management of nanodevices, especially at low temperatures.

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