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Title:	Thermoelectric generator at optimal power with external and internal irreversibilities
Authors:	Kaur, Jasleen (/jspui/browse?type=author&value=Kaur%2C+Jasleen) Johal, R.S. (/jspui/browse?type=author&value=Johal%2C+R.S.)
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Abstract:	The exact power optimization of a thermoelectric generator is performed under the simultaneous presence of internal and external irreversibilities—modeled as nonideal thermal contacts and Joule heating, respectively. We consider a modification of the constant properties model whereby thermal conductivity of the thermoelectric material has spatial dependence, giving an asymmetric fraction of the Joule heat dumped in each reservoir. In particular, with a linear form of this dependence, the heat leakage term drops out as well as Joule heat is dumped only on one side. Exact expressions for efficiency at maximum power in each of these regimes are derived and are compared at thermal impedance matching and close to equilibrium, where interesting, stepwise changes in efficiency at maximum power are observed. The present analysis leads to the inference that higher values of efficiency at maximum power are obtained when both internal and external irreversibilities are taken on the hot side.
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