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Departmental Seminar

Performance of a Thermoelectric Energy Converter under Various Optimization Criterion

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Date: 18.08.2017 **Time:** 02:30 pm

Venue: Seminar Hall (GF), Department of Physics, CUTN.

Abstract

Consumption of electricity is increasing world-wide every year and the concern for the environment motivates us to find the Eco-friendly power generation mechanism. Thermoelectric energy conversion is one of the promising methods for generating electric power from waste heat or converting an electrical power into a refrigeration. We will present the efficiency at maximum power output of a finite-time Carnot heat engine, which explain the power output of many real thermal plants and the performance of a thermoelectric energy converter at maximum power output or cooling load. We will also present our recent results on the economically favorable operational regime of a thermoelectric energy converter, which can be useful for designing a real thermoelectric energy converter.

Reference

- [1] H. B. Callen, *Thermodynamics and an Introduction to Thermostatistics* (John Wiley & Sons, New York, 1985).
- [2] A. Calvo Hernandez, A. Medina, J. M. M. Roco, J. A. White and S. Velasco, Unified optimization criterion for energy converters, *Phys. Rev. E* **63**, 037102 (2001).
- [3] G. Benenti, K. Saito and G. Casati, Thermodynamic bounds on efficiency for systems with broken time-reversal symmetry, *Phys. Rev. Lett.* **106**, 230602 (2011).
- [4] K. Brandner, K. Saito and U. Seifert, Strong bounds on Onsager coefficients and efficiency for three-terminal thermoelectric transport in a magnetic field, *Phys. Rev. Lett.* **110**, 070603 (2013).

All are welcome