Abstract Submitted
for the MAR08 Meeting of
The American Physical Society

Efficiency optimization of the Buttiker-Landauer Heat Engine
RONALD BENJAMIN, RYOICHI KAWAI, University of Alabama at Birmingham
— We study the energetic efficiency of a Brownian heat engine driven by spatially inhomogeneous temperature in presence of periodic potential, via Molecular Dynamics (MD) simulation as well as by numerically solving the inertial Langevin equation. We explore various potential shapes and different locations of the temperature boundary to identify the parameter regime in which the efficiency can be optimized. However the irreversible heat flow from the hot to the cold reservoir due to the particle's kinetic energy severely limits the efficiency and is not very sensitive to variations of the parameters. We also investigated the heat engine when it works with maximum power and found that the efficiency is much lower than that of the corresponding endoreversible engine.

Ronald Benjamin
University of Alabama at Birmingham

Date submitted: 24 Jan 2008 Electronic form version 1.4