

Abstract Submitted  
for the MAR07 Meeting of  
The American Physical Society

**Nonadiabatic electron heat pump**<sup>1</sup> F. SOLS, Univ. Complutense Madrid, M. REY, Univ. Autonoma Madrid, M. STRASS, S. KOHLER, P. HANGGI, Univ. Augsburg — We investigate a mechanism for extracting heat from metallic conductors based on the energy-selective transmission of electrons through a spatially asymmetric resonant structure subject to ac driving. This quantum refrigerator can operate at zero net electronic current as it replaces hot by cold electrons through two energetically symmetric inelastic channels. We present numerical results for a specific heterostructure and discuss general trends. We also explore the conditions under which the cooling rate may approach the ultimate limit given by the quantum of cooling power.

<sup>1</sup>Supported by MEC (Spain) and DFG (Germany).

Fernando Sols  
Universidad Complutense de Madrid

Date submitted: 20 Nov 2006

Electronic form version 1.4