

Abstract Submitted
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Magnetocaloritronic nanomachines¹ ALEXEY A. KOVALEV,
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of California, Los Angeles — We introduce and study a magnetocaloritronic circuit
element based on a domain wall that can move under applied voltage, magnetic
field and temperature gradient. We draw analogies between the Carnot machines
and possible devices employing such a circuit element. We propose a realization
of magnetocaloritronic cooling and point out the parallels between the operational
principles of magnetocaloritronic and thermoelectric cooling and power generation.
Following this analogy, we introduce a magnetocaloritronic figure of merit that en-
codes information about the maximum efficiency of such devices. Even though the
magnetocaloritronic figure of merit turns out to be very small for transition-metal
based magnets, we speculate that larger numbers may be expected in ferromagnetic
insulators.

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