

**Coefficient of Performance at Maximum Figure of Merit and its Bounds for
Low-dissipation Carnot-like Refrigerators**

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Yang Wang*

Beijing Computational Science Research Center, China

***Email of Presenting Author: wangy0727@csrc.ac.cn**

The figure of merit for refrigerators performing finite-time Carnot-like cycles between two reservoirs at temperature T_h and T_c ($T_c < T_h$) is optimized. It is found that the coefficient of performance at maximum figure of merit is bounded between 0 and $(\sqrt{9 + 8\varepsilon_c} - 3)/2$ for the low-dissipation refrigerators, where $\varepsilon_c = T_c/(T_h - T_c)$ is the Carnot coefficient of performance for reversible refrigerators. These bounds can be reached for extremely asymmetric low-dissipation cases when the ratio between the dissipation constants of the processes in contact with the cold and hot reservoirs approaches to zero or infinity, respectively. The observed coefficients of performance for real refrigerators are located in the region between the lower and upper bounds, which is in good agreement with our theoretical estimation.

Reference:

[1] Yang Wang, Mingxing Li, and Z. C. Tu A. Calvo Hernández and J. M. M. Roco Phys. Rev. E. 86 011127 (2012).