

Efficiency of an Arrangement in Series of Irreversible Thermal Engines Working at Maximum Power [†]

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Within the context of finite-time thermodynamics several regimes of performance have been used to study the well known Curzon-Ahlborn (CA) heat engine model [1–5]. Also the optimal performance and the effects on environment are studied to find the best approximation with real heat engines.

In this work we present a model of an arrangement in series of irreversible Carnot heat engines, which consist of k reservoirs connected in series, this heat engine model is working under three different regime of performance: maximum power output, maximum ecological function [6] and maximum efficient power [7]. At first we used three reservoirs, and we calculated its efficiency. For the case of maximum power output we calculated the efficiency for the case of the generalizing of k reservoirs, and we get an efficiency expression similar to the one of Curzon-Ahlborn, the irreversibilities are taken into account by irreversibility parameter R . Finally we present the comparison of the efficiencies obtained under three different regimes of performance.

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