Converting an engine driven by non-uniform temperature to one driven by load[1] MULUGETA BEKELE, TOLASA ADUGNA, TATEK YERGOU, Department of Physics, Addis Ababa University — Consider a Brownian particle moving in a symmetric ratchet potential (barrier height U_0, period L) and in an equally periodic alternate hot (T_h) and cold (T_c) temperature background along the same space coordinate (case I). Under steady state condition, the particle will attain a constant average velocity. On the other hand, if we replace the non-uniform temperature background by a uniform temperature (T_c) with a load (f) keeping the same ratchet potential (case II), the particle will attain a constant average velocity down the load at steady state. In this work, we evaluate the amount of load for case II that gives identical value of average velocity to that of the non-uniform temperature background of case I. We, in general, explore the condition under which both cases have equivalent particle velocities by varying the barrier height of the ratchet.

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