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Essential requisites for best performance of Geometric Brownian Information Engine.

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We investigate a Geometric Brownian Information Engine (GBIE) in the presence of an error-free feedback controller that transforms the information gathered on the state of particles entrapped in mono-lobal geometric detention into extractable work[1,2]. We determine the benchmarks for utilizing the available information in an output work and the optimum operating requisites for best performance. Apart from a reference measurement distance xm and feedback site xf, upshots of the information engine also depend on the transverse constant bias force (G)[3]. G tunes the entropic contribution in the effective potential and the standard deviation (σ) of the equilibrium marginal probability distribution. We find that the upper bound of the achievable work shows a crossover from (5/3-2ln2)kBT to 1/2kBT when the system changes from entropy to an energy-dominated one. The higher loss of information during the relaxation process accredits the lower value of work in entropic instances of GBIE. We recognize that the work extraction reaches a global maximum when xf=2xm with xm 🛛 0.6 σ , irrespective of the extent of the entropic limitation. Also, we explore the effect of entropic control on the unidirectional passage of the particle and efficacy of the GBIE[4].

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