

Abstract Submitted
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Maxwell's Demon Dynamics: Deterministic Chaos in Physical Information Processing ALEC BOYD, None — Information processing allows for the extraction of work from a thermal reservoir, as demonstrated by Maxwell's Demons. However, this apparent violation of the second law of Thermodynamics is avoided by recognizing the balancing energetic cost of information processing. This cost was thought to be captured by the energetic cost of erasure, described by Landauer's Principle. However, results in the past decade show that erasure is not the sole culprit, and that Landauer's Principle can be fudged. We introduce a new explicit construction of the Szilard engine, a 1-bit Maxwellian Demon, where energetic costs are exactly calculable for all information processing steps, which illustrates the flexibility of information processing bounds. This new construction allows us to represent the Szilard engine by a deterministic chaotic system—the Szilard Map— that encapsulates the measurement, control, and erasure protocol by which Maxwell's Demons extract work from a thermal reservoir. The map's degree of chaos is proportional to the energy extraction during control.

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None

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