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# What is thermal equilibrium and how do we get there?

*Monday 30 September 2024 11:00 (1 hour)*

We present a simple, rigorous example (which is essentially a free fermion chain) of an isolated macroscopic (but finite) quantum system that exhibits thermalization (in a phenomenological sense) from any pure initial state in the microcanonical energy shell. The essential ingredients of the proof are the large-deviation type strong ETH (energy eigenstate thermalization hypothesis) bound and the absence of degeneracy in the energy spectrum. As far as we know, this is the first concrete realization of the philosophy on the foundation of equilibrium statistical mechanics proposed by von Neumann in 1929.

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