Bipartite Entanglement Entropy

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Quasiperiodic Kicked Rotor Bipartite Entanglement Entropy

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- This has the drawback of increasing computational complexity of each individual step and the memory used at any given time is large.

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- Separate the floquet operator into momentum space and position space parts.
- Use a single pure state for calculations.
- Fourier transform the state at each time step and apply both parts of the floquet operator in their resp. basis.

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- Peak memory required scales the same way but we have reduced it by a constant factor and it is not used in all calculations.

Results

We use $\hbar = 2.85, \omega_2 = 2\pi\sqrt{5}, \omega_3 = 2\pi\sqrt{13}$, the momentum ranges from -10 to 10

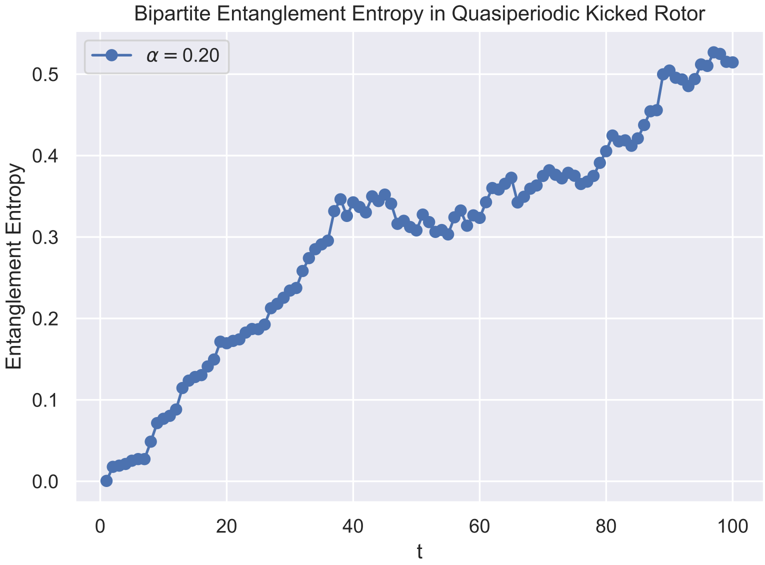

Figure 1: Precritical (Insulator): $K = 4, \alpha = 0.2$

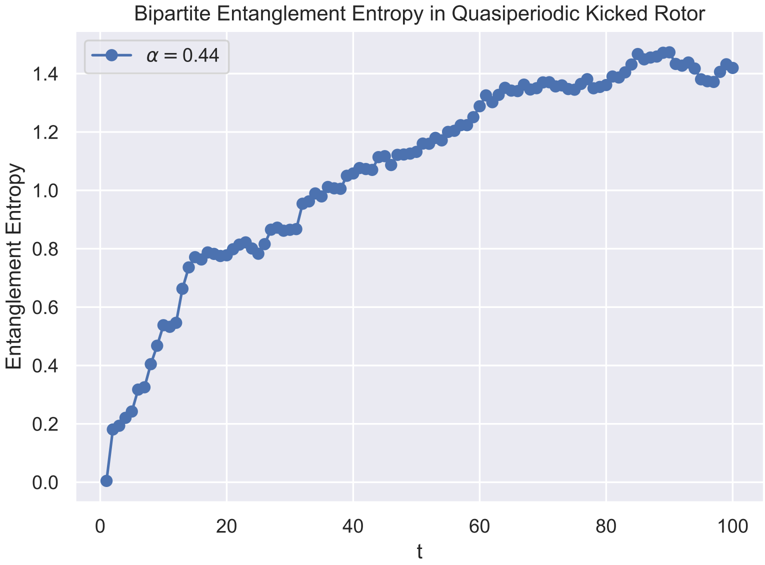

Figure 2: Critical: $K = 6.36, \alpha = 0.4375$

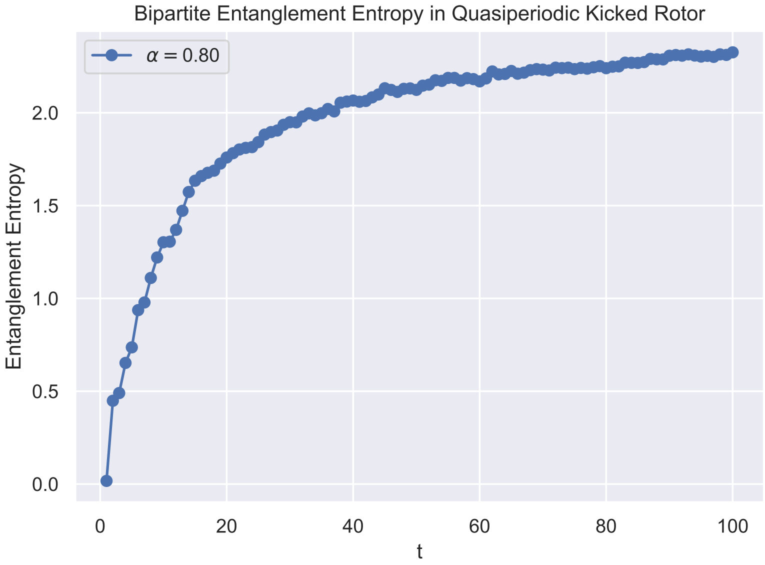

Figure 3: Post-critical (Metal): $K = 8, \alpha = 0.8$

- I don't see much of a trend here. The entanglement grows faster and higher with higher K values i.e. more diffusive the regime higher the entanglement for the same number of time steps but other than that, I don't see anything here.