SwissMAP Annual General Meeting



Contribution ID: 26

Type: not specified

Phenomenology of Krylov Complexity

Tuesday 13 September 2022 09:30 (30 minutes)

Krylov complexity is a notion of complexity that characterizes the spread of an operator over the algebra of observables by measuring its projection over a suitable orthonor-mal basis of this algebra built out of nested commutators of the Hamiltonian with the operator. Using this basis, operator dynamics can be mapped to a one-dimensional hopping problem. In this talk I will present recent results on the time evolution of Krylov complexity away from the thermodynamic limit for both chaotic and integrable systems. While the former display the complexity profile expected in the context of the butterfly effect in AdS/CFT, the latter feature a late-time suppression of complexity due to an enhanced localization effect in the afore-mentioned hopping problem. I will illustrate this phenomenology by analyzing a system that is able to interpolate between integrable and chaotic regimes.

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