Quantum Ergodicity and the Dynamical Generation of Entanglement in Kicked Coupled Tops COLLIN TRAIL, VAIBHAV MADHOK, IVAN DEUTSCH, SHOHINI GHOSE, LEIGH NORRIS, ARJENDU PATTANAYAK — We explain how the long-time average dynamically generated entanglement in a Hamiltonian bipartite system is related to the corresponding classical dynamics in the semiclassical limit. Where classical dynamics is chaotic, ergodic mixing leads to the generation of "random quantum states." These states possess the typical entanglement of a state randomly sampled from the appropriate Hilbert space under the unitarily invariant Haar measure. We exemplify these results using a system of coupled kicked-tops in which entanglement and chaos arise from the same physical effect in contrast to previous studies. We present quantitive predictions of the dynamically generated entanglement, which is influenced by the time symmetries of the system and the structure of the Hilbert space, under a variety of different conditions, and show a close fit to numerical simulations.

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