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Using quantum chaos to control the production of bipartite entangled states LOCK CHEW, Nanyang Technological University, NING CHUNG, National University of Singapore — Recently, we have shown that it is possible for the entanglement dynamics to depend on the global classical dynamical regime instead of the local classical behavior. We observe that as the corresponding classical system becomes more chaotic, the rate of entanglement production increases with the emergence of larger entanglement entropy in the steady state. This suggests that quantum chaos can be used to control the generation of highly entangled quantum states, which are typically more robust against the effects of decoherence from the environment. Furthermore, the dependence of our system on the global classical dynamical regime indicates that the mode of production is insensitive to errors in the preparation of the initial separable coherent states. In this talk, I will present our recent results of using the additional control of quantum squeezing to further enhance the entanglement of the dynamically generated quantum states. I will show that the concomitant application of quantum squeezing and quantum chaos leads to a more entangled state at a faster production rate relative to squeezing without quantum chaos.

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