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Generating Entangled States With Hybrid Parity Gates[1] ZHI-MING ZHANG, FENG MEI, YA-FEI YU, XUN-LI FENG, South China Normal University — We propose a scheme for generating entangled states among different single atoms trapped in separated cavities. In our scheme, by reflecting an input coherent optical pulse from a cavity with a single trapped atom, a controlled phase-shift gate between the atom and the coherent optical pulse can be achieved. Based on this gate and homodyne detection, we construct an n-qubit parity gate and show its use for distribution of a large class of entangled states, including the GHZ states, the W states, the Dicke states, and certain sums of the Dicke states. We also show that such distribution can be performed with high success probability and high fidelity even in the presence of channel loss.

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Zhi-Ming Zhang
South China Normal University

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