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【568】Local Transformations of Multiple Multipartite States

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Multipartite entanglement can be quantified by considering Local Operations assisted by Classical Communication (LOCC). However, for systems with fixed local dimensions, the partial order induced by LOCC is generically trivial. Consequently, we study a physically motivated extension of LOCC: multi-state LOCC. Here, one considers simultaneous LOCC transformations of finitely many pure states. In the multipartite case, we show one can change the stochastic LOCC (SLOCC) class of the individual states; that one can perform transformations not possible in the single-copy case, transferring entanglement from one state to the other; provide examples of multipartite entanglement catalysis; and find improved probabilistic protocols. In the bipartite case, we find numerous non-trivial LU transformations.

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