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AG Theoretical Quantum Optics

Multimode Entanglement and its Detection

The nonclassical correlation entanglement is a key resource in many quantum technologies, such as quantum computing, quantum teleportation, and quantum key distribution [1]. In a multimode state, entanglement can be defined in multiple ways, always as the absence of separability. The individual modes of a compound Hilbert space, wherein the considered states lie, can be decomposed in different partitions. It is common to address separability with respect to these partitions [2]. On the other hand, separable states for different partitions can be convexly combined to define a different form of separability [3].

[1] M. A. Nielsen and I. L. Chuang, *Quantum Computation and Quantum Information*, (Cambridge University Press, Cambridge, 2000).

[2] R. F. Werner, *Phys. Rev. A* **40**, 4277 (1989).

[3] M. Seevinck, and G. Svetlichny, *Phys. Rev. Lett* **89**, 060401 (2002).

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