Abstract

We review the concept of entanglement and discuss its intimate relation with nonlocality in quantum physics; quantum contextuality will also be discussed.

We then discuss specifically the bound entanglement. Bound entanglement, being entangled yet not distillable, is essential to our understanding of the relation between nonlocality and entanglement besides its applications in certain quantum information tasks. Recently, bound entangled states that violate a Bell inequality have been constructed for a two-qutrit system, disproving a conjecture by Peres that bound entanglement is local. A family of new nonlocal bound entangled states for all finite dimensions larger than two will be presented, making possible their experimental demonstrations on most general systems.