

中国科学院数学与系统科学研究院

量子论与信息论

学术报告

报告题目: **Entanglement Detection Length of Multipartite Quantum States**

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摘要: Multipartite entanglement is a crucial resource for quantum computing, communication, and metrology. However, detecting this resource can be challenging: for genuine multipartite entanglement it may require global measurements that are hard to implement experimentally. In this study, we introduce the concept of entanglement detection length, defined as the minimum observable length required to detect genuine multipartite entanglement. We characterize the entanglement detection length for various types of genuinely entangled states, including GHZ-like states, Dicke states, and graph states. We also present a classification of genuinely entangled states based on entanglement detection length. Furthermore, we demonstrate that the entanglement detection length differs from the minimum observable length needed to uniquely determine a genuinely entangled state. Our findings are valuable for minimizing the number of observables that must be measured in entanglement detection.