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：Uncertainty of quantum channels via modified generalized variance and modified generalized Wigner-Yanase-Dyson skew information

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摘　　要： Uncertainty relation is a fundamental issue in quantum mechanics and quantum information theory. By using modified generalized variance (MGV), and modified generalized Wigner-Yanase-Dyson skew information (MGWYD), we identify the total and quantum uncertainty of quantum channels. The elegant properties of the total uncertainty of quantum channels are explored in detail. In addition, we present a trade-off relation between the total uncertainty of quantum channels and the entanglement fidelity and establish the relationships between the total uncertainty and entropy exchange/coherent information. Detailed examples are given to the explicit formulas of the total uncertainty and the quantum uncertainty of quantum channels. Moreover, utilizing a realizable experimental measurement scheme by using the Mach-Zehnder interferometer proposed in Nirala et al. (Phys Rev A 99:022111, 2019), we discuss how to measure the total/quantum uncertainty of quantum channels for pure states.