專題演講

量子訊息論與保持問題

Quantum information theory and preserver problems

曹懷信　教授
陝西師範大學
數學與信息科學學院

台灣中山大學應用數學系
黃毅青　教授

I will present some of my works on the quantum information theory. Here, quantum data refers to positive density matrices/operators and quantum channels refer to completely positive maps . The story starts with the Wigner theorem on transition probability.

My study on several preserver problems of function, matrix and operator algebras follow. A typical problem states that whether two quantum systems modeled von Neumann algebras are isomorphic if they share identical transition probability structures. The talk will end by a briefing of my recent works on divergence preserver problem, which are applications of Bregman distances developed in the optimization theory.

Bell Nonlocality and EPR Steering

Bell nonlocality and Einstein-Podolsky-Rosen (EPR) steering are very important quantum correlations of a composite quantum system. Bell nonlocality of a bipartite state is a kind of quantum correlations demonstrated by some local quantum measurements, while EPR steering is another form of quantum correlations, observed firstly by Schrödinger in the context of famous EPR paradox. In this talk, we introduce Bell nonlocality and EPR steering of bipartite states, including mathematical definitions and characterizations of these two quantum correlations, the convexity and compactness of the sets of all Bell local states and all EPR unsteerable states, respectively. We also derive some sufficient conditions for a state to be steerable, which imply that whenever Alice has two POV measurements such that the sets of Bob's normalized conditional states become two disjoint sets of pure states, or whenever she has one POV measurement such that Bob's normalized conditional states become a linearly independent set of pure states, Alice can steer Bob's state.

日期：107年11月23日　時間：15:10 - 17:00

地點：理工一館 A324

N D H U
Applied Mathematics