Quantum Physics

Distinguishing quantum channels via magic squares game

M. Ramzan, M. K. Khan

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We study the effect of quantum memory in magic squares game when played in quantum domain. We consider different noisy quantum channels and analyze their influence on the magic squares quantum pseudo-telepathy game. We show that the probability of success can be used to distinguish the quantum channels. It is seen that the mean success probability decreases with increase of quantum noise. Where as the mean success probability increases of quantum memory. It is also seen that the behaviour of amplitude damping and phase damping channels is similar. On the other hand, the behaviour of depolarizing channel is similar to the flipping channels. Therefore, the probability of success of the game can be used to distinguish the quantum channels.

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