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Sensors which can be used for remote quantum estimation

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Abstract

Quantum sensors have a significant advantage over their classic counterparts, and hence their practical application is of particular importance. However, in many practical scenarios, it is not possible to measure or estimate at close distances and endangers the security of the process. In this paper, with the help and inspiration of the quantum teleportation process, we propose the design of a sensor remotely estimating the parameter encoded into the quantum state of a quantum system. We show how the control over classical and quantum noises, affecting the sensor, can enhance the estimation. Moreover, the practical implementation of this project is discussed in detail.

Keywords: quantum sensors, quantum Fisher information, teleportation

For full article, refer to the Persian section