

Optimal reconstruction of states in qutrits system

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Based on the mutually unbiased measurements, an optimal tomographic scheme for the single-qutrit states and two-qutrit states is presented explicitly. Because the mutually-unbiased-bases based state reconstruction process is free of information waste, we call our scheme the optimal one. That is to say, by optimal we mean the number of required conditional operations reaches the minimum in our tomographic scheme for the states of qutrits system. We will pay our special attention on how to realize those different mutually unbiased measurements, i.e. how to decompose each transformation that connects each mutually unbiased basis with the standard computational basis. We found that all those transformations can be decomposed into several basic implementable single- and two-qutrit unitary operations. This will help the experimental scientists to realize the most economical reconstruction of quantum states in qutrits system.

Comments: 4 pages, comments are welcome

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