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Title:	Combined-probability space and certainty or uncertainty relations for a finite-level quantum system
Authors:	Sehrawat, A. (/jspui/browse?type=author&value=Sehrawat%2C+A.)
Keywords:	Quantum qudit Combined-probability space
Issue Date:	2017
Publisher:	APS
Citation:	Physical Review A, 96 (2)
Abstract:	The Born rule provides a probability vector (distribution) with a quantum state for a measurement setting. For two settings, we have a pair of vectors from the same quantum state. Each pair forms a combined-probability vector that obeys certain quantum constraints, which are triangle inequalities in our case. Such a restricted set of combined vectors, called the combined-probability space, is presented here for a d-level quantum system (qudit). The combined space is a compact convex subset of a Euclidean space, and all its extreme points come from a family of parametric curves. Considering a suitable concave function on the combined space to estimate the uncertainty, we deliver an uncertainty relation by finding its global minimum on the curves for a qudit. If one chooses an appropriate concave (or convex) function, then there is no need to search for the absolute minimum (maximum) over the whole space; it will be on the parametric curves. So these curves are quite useful for establishing an uncertainty (or a certainty) relation for a general pair of settings. We also demonstrate that many known tight certainty or uncertainty relations for a qubit can be obtained with the triangle inequalities.
URI:	<a href="https://journals.aps.org/pr/abstract/10.1103/PhysRevA.96.022111">https://journals.aps.org/pr/abstract/10.1103/PhysRevA.96.022111</a> ( <a href="https://journals.aps.org/pr/abstract/10.1103/PhysRevA.96.022111">https://journals.aps.org/pr/abstract/10.1103/PhysRevA.96.022111</a> ) <a href="http://hdl.handle.net/123456789/1861">http://hdl.handle.net/123456789/1861</a> ( <a href="http://hdl.handle.net/123456789/1861">http://hdl.handle.net/123456789/1861</a> )
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