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Title:	Quantifying superpositions of quantum evolutions
Authors:	Bera, M.N. (/jspui/browse?type=author&value=Bera%2C+M.N.)
Keywords:	Quantum mechanics Nonclassical phenomena Superpositions
Issue Date:	2019
Publisher:	American Physical Society
Citation:	Physical Review A 100(4).
Abstract:	Quantum mechanics allows coherent superposition of different states of matter. This quality is responsible for major nonclassical phenomena that occur in quantum systems. Beyond states, coherent superpositions are also possible among quantum evolutions. We characterize such superpositions here. A resource theoretic framework is developed to quantify superposition present in an arbitrary quantum evolution. In addition to characterization, the framework considers superposition as a quantum resource. This resource can be exploited to perform certain quantum tasks that are otherwise impossible. We identify maximally resourceful evolutions and demonstrate how these could enable one to implement arbitrary quantum operations and superoperations. We also discuss the roles of superposition to exhibit nonclassical behaviors present in evolutions; for example, acausality, temporal Bell correlations, and indefinite temporal and causal orders.
URI:	<a href="https://journals.aps.org/pr/abstract/10.1103/PhysRevA.100.042307">https://journals.aps.org/pr/abstract/10.1103/PhysRevA.100.042307</a> ( <a href="https://journals.aps.org/pr/abstract/10.1103/PhysRevA.100.042307">https://journals.aps.org/pr/abstract/10.1103/PhysRevA.100.042307</a> ) <a href="http://hdl.handle.net/123456789/1777">http://hdl.handle.net/123456789/1777</a> ( <a href="http://hdl.handle.net/123456789/1777">http://hdl.handle.net/123456789/1777</a> )
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