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Incoherently generated coherence and immunity to decoherence[1]
BARRY SANDERS, University of Calgary, RAISA KARASIK, University of California/Berkeley, KARL-PETER MARZLIN, University of Calgary, K. BIRGITTA WHALEY, University of California/Berkeley — The decoherence free subspace is important as states in this subspace are immune to the decohering effects of open system dynamics. We introduce a new kind of state, which, for certain open system dynamics, can be made immune to decoherence by driving the system with an appropriate driving field: we refer to these states as incoherently generated coherent states, and they are pure states that evolve unitarily despite coupling to the open system. The seemingly non-unitary open system driving term becomes essential as a partner with the driving field to generate coherences that stabilize these special states. We prove that such states cannot exist for most open system models with finite-dimensional systems but are readily found for infinite-dimensional systems, and we present examples of such states for suitable open systems.

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