



Iranian Journal of Physics Research, Vol. 22, No. 4, 2023
DOI: 10.47176/ijpr.22.4.61469

Completely positive reduced dynamics with non-Markovian initial states

S Nazifkar* and I Sargolzaei

Department of Physics, University of Neyshabur, Neyshabur, Iran

E-mail: nazifkar@neyshabur.ac.ir

(Received 19 June 2022 ; in final form 23 October 2022)

Abstract

Consider an open quantum system S , interacting with its environment E , and also an ancillary Hilbert space R . The reduced dynamics of the system S is given by a completely positive map, if the set $\mathbf{S} = \{\rho_{SE}\}$, of possible initial states of the system-environment, can be written as a *steered* set from a tripartite *Markov* state τ_{RSE} . In this paper, we call such steered states ρ_{SE} as *Markovian* states, and study a physical case, in which the reduced dynamics of the system can be completely positive, even when the initial states of the system-environment ρ_{SE} are non-Markovian.

Keywords: open quantum system, completely positive map, Markov state

For full article, refer to the Persian section