

“Completely Positive Maps and System-Environment Correlations”

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Linear, completely positive maps are the standard tool used to describe quantum open system dynamics. When the system and environment are initially correlated there is no canonical way to define a linear map for the dynamics. As a consequence any claim about complete positivity in the presence of correlations is, at best, limited to certain constraints that may have little or no physical significance. I discuss these issues in general and present a counterexample to previous results relating complete positivity to quantum correlations.

Joint work with Animesh Datta, Kavan Modi, Ángel Rivas and César A. Rodríguez-Rosario; PRA (2013), arXiv:1212.4387.