Abstract Submitted
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Modelling Quantum Subsystem Dynamics[1] JASON DOMINY, University of Southern California, ALIREZA SHABANI, Google Research, DANIEL LIDAR, University of Southern California — We describe a general and consistent mathematical model for linear subsystem quantum dynamical maps, developed from a minimal set of postulates, primary among which is a relaxation of the usual, restrictive assumption of uncorrelated initial system-bath states. The resulting space of physically realizable dynamical maps, far from being limited to only completely positive (CP) maps, comprises essentially all C-linear, Hermiticity-preserving, trace-preserving subsystem maps. We will discuss some implications for the standard theory of open quantum systems and the search for necessary and sufficient conditions for complete positivity. See [1], [2] for additional details. [1] Jason M. Dominy, Alireza Shabani, and Daniel A. Lidar. A general framework for complete positivity. *Quantum Inf. Proc.*, 2015. (To appear). URL: `http://dx.doi.org/10.1007/s11128-015-1148-0`. [2] Jason M. Dominy and Daniel A. Lidar. Beyond complete positivity. `arXiv:1503.05342`.

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