

Abstract Submitted
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Preserving Positivity During Quantum Brownian Evolution AL-
LAN TAMESHTIT — The conventional quantum Brownian propagator may be derived by considering a system of interest bilinearly coupled to and initially uncorrelated with a reservoir. Although possessing many attractive features, it is well known that this propagator does not preserve positivity of density operators, violating a basic tenet of quantum mechanics. (A density operator ρ is positive means $\langle\psi|\rho|\psi\rangle \geq 0$ for all ψ). In an effort to rectify this problem, workers have modified the propagator by the *ad hoc* addition of extra terms to the corresponding generator. We show that no such terms need be added to the generator to preserve positivity provided one accounts for the rapid entanglement of the system of interest and the reservoir on a time scale too short for the conventional propagator to be valid.

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