

Abstract Submitted
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Static environments in open quantum systems IAN DURHAM, Saint Anselm College — An open quantum system is one that interacts in some way with another quantum system external to itself, e.g. an environment. In some cases this environment is constrained to be static under unitary transformations. It turns out that there are severe limitations on the types of systems and environments that can interact in such cases. For instance, we find that the system may only be in a pure state under most such transformations. In addition we find that a static environment cannot serve as a sub-system of a Bell state. It *may* serve as a sub-system of a GHZ state in most cases, but its feasibility is dependent upon the unitary transformation that is applied to any part of the system. We note an implication that these results have for recent studies of quantum computation in the presence of closed time-like curves.

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