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Stability and Concurrence of an Entangled Theta State Qubit in a Reissner -Nordstrom Spacetime KEITH ANDREW, BENJAMIN THORNBERRY, ERIC STEINFELDS, Physics and Astronomy, Western Kentucky University — We consider the construction of an X state density matrix for an open Dirac system in a curved spacetime manifold with geodesic structure given by the Reissner-Nordstrom metric. Using an asymptotic Minkowski Hadamard-CNot gate configuration we construct a maximally entangled Bell state density matrix. This system is generalized using a Theta State Qubit representation and coupled to an environmental thermal background given by the cosmic microwave background distribution and located in a Reissner-Nordstrom (RN) space-time. The RN spacetime corresponds to a static spherically symmetric charged mass distribution with an outer Event Horizon and an inner Cauchy Horizon. The metric structure of the horizons is a function of the mass and charge distribution of the system. By applying a Bogoliubov transformation in Kruskal coordinates to the entangled state and a filter, which undergo a weak measurement in a region near the horizon while being exposed to the RN Hawking radiation, we can express the qubit density matrix as a function of temperature. We plot the Concurrence as functions of mass and charge to determine the parameter range that lead to the decay and eventual destruction of the entanglement of the qubit state

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