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Continuous time dissipation-assisted quantum walks on a finite lattice ROLAND CRISTOPHER CABALLAR, National Institute of Physics, College of Science, University of the Philippines Diliman, BIENVENIDO BUTANAS JR.[1], Department of Physics, Central Mindanao University, University Town, Musuan, Maramag, Bukidnon, Philippines, VLADIMIR VILLEGAS, National Institute of Physics, College of Science, University of the Philippines Diliman, MARY AILEEN ANN ESTRELLA, Manila Business Consulting Inc., Loyola Heights, Quezon City, Philippines — We consider a possible dissipative quantum state transport scheme which makes use of a system which is moving on an N-site 1-dimensional lattice, coupled to an environment. The time-evolved interaction Hamiltonian for this system is similar in form to the Hamiltonian for a system undergoing a quantum walk, so the system is said to be undergoing a dissipation-assisted quantum walk. We then derive the master equation describing the dynamics of the system, making use of the Redfield equation in doing so. Numerical evaluation of the resulting master equation shows that it is possible for this quantum state transport scheme to be used to transport excited states to the end of the lattice, so long as the coupling between the system and the environment is weak. Furthermore, the resulting state will be a pure state, making it ideal as well for dissipative preparation of pure quantum states.

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