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Gamal Mograby*, gamal.mograby@uconn.edu. *Classical and quantum mechanical models on graphs.*

We consider discrete one-dimensional classical and quantum mechanical models and present a lifting procedure to define their counterparts on a large class of graphs. As an application, we investigate the problem of perfect quantum state transfer and show that our approach can be extended to nonlinear (classical) Hamiltonian systems. Depending on time, we will illustrate various applications in quantum information processing, Toda lattices, Solitons on graphs, and Lax pairs formalism. (Received January 18, 2022)