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Perfect quantum state transfer on weighted paths

A quantum spin chain is a proposed method for transferring a quantum state over small distances. We focus on perfect state transfer (PST) in which one particle is encoded with the desired state and after the spin chain evolves over some time the same state emerges in a different particle. In particular, we are interested in PST for the case in which the spin chain can be modeled by a weighted path (allowing for loops). We explore PST on these weighted paths using orthogonal polynomials.