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Perfect State Transfer on Trees with Small Diameter

Quantum computing is believed to provide many advantages over traditional computing, particularly considering the speed at which computations can be performed. One of the challenges that needs to be resolved in order to construct a quantum computer is the transmission of information from one part of the computer to another. This transmission can be implemented by spin chains, which can be modeled as a graph, and analyzed using algebraic graph theory. We investigate the possibility of perfect state transfer on trees with small diameter, showing it is impossible for trees of diameter 4, and discussing progress for trees of diameter 5. Joint work with Steve Kirkland.