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Quantum Walks on Oriented Graphs

A quantum walk on a graph is defined based on a Hermitian matrix associated with the graph, such as the adjacency matrix. Although directed graphs do not have symmetric adjacency matrices, oriented graphs, where every edge has a unique direction, have Hermitian but non-symmetric matrix associated to them. This gives rise to a different kind of quantum walk. In this talk, we discuss some properties of these quantum walks, focusing particularly on the similarities and differences between them and their better-studied counterparts on undirected graphs.