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Peak state transfer in continuous quantum walks

Quantum spin networks offer a promising way to transfer quantum information between different parts of a quantum computer, but how reliably can a quantum state be transferred between two sites? We study this question using continuous-time quantum walks generated by adjacency or Laplacian Hamiltonians. While the desirable perfect state transfer (PST) is not always possible, the transfer probability may still attain its upper bound. This is known as peak state transfer. In this talk, we discuss peak state transfer and its behaviour under graph operations. We also explore some elementary properties of the bounding matrix, which provides the entrywise time-independent upper bounds on transition amplitudes between any pair of vertices in a graph. This work is a product of the PIMS First Year Interest Groups (FYIG), joint with Joy Cooper, Hermie Monterde, Alireza Talebpour, and Ruth Wang.