

Neutralising the Dark Side of Quantum Networks

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Transport across quantum networks underlies many problems from state transfer in a spin network, to the movement of a quantum walker on a graph, to energy transport in photosynthetic complexes. However, networks can contain "dark subspaces" that block the transportation, and various methods used to enhance transfer on quantum networks can be viewed as equivalently avoiding, modifying, or destroying the dark subspace. We use graph theoretical tools to identify the dark subspaces and thus identify how to suppress the dark side. We also apply these results to two quantum networks, one inspired by a photosynthetic complex and another by the M13 virus structure.