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*Quantum state transfer in the algebra of the Johnson scheme*

A real matrix  $A$  in the adjacency algebra of a distance regular graph represents a spin network with non-nearest neighbour couplings. We are interested in a quantum phenomenon called perfect state transfer, that is,  $|\exp(itA)_{u,v}| = 1$  for some vertices  $u, v$  and time  $t$ . It is known that the only generalized Johnson graphs that admit perfect state transfer are disjoint unions of edges. In this talk, we characterize all real matrices in the algebra of the Johnson scheme that admit perfect state transfer. This is joint work with Luc Vinet.