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A fully connected qubit network model for quantum information processing applications[1] MARK COFFEY, Colorado School of Mines — We describe a fully connected spin network model for quantum information processing applications. This scalable network in the case of spin 1/2 has recently been realized in the laboratory, using Josephson phase qubits, and other solid-state implementations are likely. We have recently jointly developed a rigorous protocol for producing the important maximally entangled generalized GHZ states for this implementation [1]. (GHZ states generalize the well known Bell states for two qubits.) An exact solution for the eigenstructure of a certain subspace of partial uniform superpositions enables the protocol to be detailed for an arbitrary number of qubits. An overview of this work and a short description of other quantum information processing applications of the spin network will be given. Joint work with Andrei Galiautdinov and Ron Deiotte. [1] A. Galiautdinov, M. W. Coffey, and R. Deiotte, arXiv:0907.2225v2 (2009); to appear in Phys. Rev. A.

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