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Dynamically Corrected Gates for Qubits with Always-on Ising Interactions: Error model and fault-tolerance AMRIT DE, LEONID PRYADKO, Dept of Physics & Astronomy, University of California - Riverside — We prescribe a method to implement a universal set of dynamically-corrected quantum gates on any qubit network that forms a sparse bipartite graph using sequences of decoupling pulses. The qubit networks have Ising interactions that are always turned on and our method works to selectively decouple the interactions even when they differ. We study the error operators associated with the constructed gates for small qubit clusters and give bounds on high-order errors. We find that the present gate set can be used to achieve fault-tolerance with a concatenated code by choosing a suitable qubit network.

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