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A two reservoir model of quantum error correction JAMES CLEMENS, JULIO GEA-BANACLOCHE, University of Arkansas — We consider a two reservoir model of quantum error correction with a hot bath causing errors in the qubits and a cold bath cooling the ancilla qubits to a fiducial state. The error correction acts as a kind of refrigeration process to maintain the data qubits in a low entropy state by periodically moving the entropy to the ancilla qubits and then to the cold reservoir. We quantify the performance of the error correction as a function of the reservoir temperatures and cooling rate by means of the fidelity and the residual entropy of the data qubits. We also make a comparison with the continuous quantum error correction model of Sarovar and Milburn (quant-ph/0501038).

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