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Using classical bit-flip correction for error mitigation in quantum computations

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We demonstrate that classical bit-flip correction can be employed to mitigate measurement errors on quantum computers. Importantly, our method can be applied to any operator, any number of qubits, and any realistic bit-flip probability. Starting with the example of the longitudinal Ising model, we then generalize to arbitrary operators and test our method both numerically and experimentally on IBM quantum hardware. As a result, our correction method reduces the measurement error on the quantum hardware by up to one order of magnitude.

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Session Classification: Algorithms (including Machine Learning, Quantum Computing, Tensor Networks)

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