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Analytical techniques for noise filtering in quantum logic gates

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Abstract content
   (Max 300 words)

Describing quantum logic operations in the presence of time-dependent, noisy environments pose significant theoretical challenges. Here we use effective Hamiltonian theory as an efficient means of modelling non-commuting control operations perturbed by classical noise sources. The method allows calculation of the ensemble averaged fidelity of a control operation to arbitrary order in terms of a filter function. In particular we study the performance of dynamically corrected gates as predicted by the effective theory, and compare with brute-force numerical calculations.

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