

Scalable quantum computation via local control of only two qubits

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Reference:

D. Burgarth, K. Maruyama, M. Murphy, S. Montangero, T. Calarco, F. Nori, M. B. Plenio

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We apply quantum control techniques to a long spin chain by acting only on two qubits at one of its ends, thereby implementing universal quantum computation by a combination of quantum gates on these qubits and indirect swap operations across the chain. It is shown that the control sequences can be computed and implemented efficiently. We discuss the application of these ideas to physical systems such as superconducting qubits in which full control of long chains is challenging.

- [AQUTE](#) [2]
- [QIPC](#) [3]

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