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Error Scaling of Trotter Product Formulas

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Solving the Schrödinger equation is one of the most fundamental tasks in quantum physics. However, obtaining exact solutions is often challenging, if not outright infeasible. In such cases, approximation methods become essential. Among them, Trotter product formulas offer a particularly powerful and versatile approach: they approximate the time-evolution operator by decomposing it into simpler pieces, each corresponding to more tractable dynamics. Owing to their conceptual simplicity and broad applicability, product formulas have become standard tools in quantum simulation and quantum computation.
In this talk, I will give an overview of the theory behind Trotter product formulas, with a special emphasis on their convergence behavior.

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