6. Summary & Future direction

✓ Complete proof of the MPF cost for generic local Hamiltonians

✓ Truncation order $p_0 \in \mathcal{O}(\log(N/\epsilon))$ for nested commutators
plays a central role in reducing N-scaling, i.e., reflecting the locality

✓ Application: MPF algorithm for time-dependent $H(t)$

K. Mizuta, T. N. Ikeda, and K. Fujii, arXiv:2410.14243 (2024) [QIP2025] **ver. 2.**

Other potential applications: Trotter extrapolation or interpolation

J. D. Watson, et al., PRX Quantum **6**, 030325 (2025), etc.