Time evolution with neural quantum states

ABSTRACT: The simulation of the time evolution of many-body quantum systems is generally highly complex because of the curse of dimensionality and the typical large entanglement in evolving quantum systems subject, for instance, to a sudden quench. Neural quantum states are a promising approach to simulate such dynamics as they can represent efficiently volume law states. However most neural quantum states approaches struggle to simulate up to long times because of the inaccuracies stemming from sampling of the wavefunction. Here we discuss different how one can describe larger many-body quantum systems and remain accurate for longer times.

References [1] Wenxuan Zhang, Bo Xing, Xiansong Xu, Dario Poletti, “Paths towards time evolution with larger neural-network quantum states”, arXiv:2406.03381
[2] Dingzu Wang, Wenxuan Zhang, Xiansong Xu, Dario Poletti, manuscript in preparation.