Contribution ID: **50** Type: **not specified**

Applications of Transfer Matrix Based Quantum Algorithms

Quantum simulation utilizes the relatively easily controllable quantum systems to simulate and understand the more complicated quantum processes. For finite size systems, many quantum algorithms have been put forward to tackle the real time evolution and imaginary time evolution. However, for systems in the thermodynamic limit, the practical realization of the simulation schemes are still under exploration. In this project, we will focus on the exploration and applications of quantum algorithms in thermodynamic limit. Inspired by the successful applications in tensor network, we will focus on the transfer matrix-based quantum algorithms to simulate novel dynamics or thermodynamics. This project starts from benchmarking the one-dimensional transverse field Ising model, and further models with novel properties can be investigated if time allows.

Group

IT Zeuthen

Project Category

B5. Computing

Special Qualifications

interest in quantum computing, experience in algorithms, Python programming skills, PyTorch or Pennylane, Concept of Tensor Networks

Primary authors: ANGELIDES, Takis (CQTA (Centre f. Quantum Techno. a. Application)); GUO, Yibin (CQTA (Centre f. Quantum Techno. a. Application))