MOQS – MOlecular Quantum Simulations

Topic title	Exact tensor-network based methods for interacting many-body dynamics
Main host institution	University of Ljubljana https://www.uni-lj.si/university/
Supervisor	Tomaz Prosen tomaz.prosen@fmf.uni-lj.si
Co-Supervisor	Dr. Michael Marthaler, HQS, Germany michael.marthaler@quantumsimulations.de
Mentor[1]	Prof. Dr. Guido Pupillo pupillo@unistra.fr
Secondment institutions	HQS, Germany (3 Months) University of Strasbourg, France (3 Months)
Preferred starting date	01 October 2021

Topic description

The main research direction is the development and use of exact algebraic and numerical methods to investigate the general structure of exact time-dependent matrix product ansatz and search for similar exact and efficient descriptions in two dimensions, and/or in the open-system's context where boundaries of locally interacting lattice model are coupled to stochastic baths. In later stages we expect to apply exact descriptions of real time relaxation dynamics in the problems of quantum chemistry.

Recommended applicant's profile

The applicant should have completed a masters level study in Physics, preferably in the direction of theoretical and/or mathematical physics. The candidate should be willing to do both analytical and numerical/computational intense research work.

[1] Mentor: The primary role of the mentors will be to identify and facilitate specific training objectives, advise on any problems faced by the ESR, including career matters with an external perspective and provide mediation in the case of disputes.

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