

Quantum dynamics with normalizing flows

In this project, we are investigating the viability of applying machine learning to quantum mechanical simulations of molecular dynamics, such as molecular vibrations and rotations in external fields and electron ionization by strong laser fields. The underlying concept of this method is to find solutions to the Schrödinger equation using recurrent neural networks combined with normalizing flows, also known as recurrent flow networks. Depending on the student's qualifications, the student's role will be to examine, through numerical simulations, the performance of various model modifications in dynamics simulations or to conduct a rigorous mathematical analysis of convergence properties.

Field

A6: Theory and computing

DESY Place

Hamburg

DESY Division

FS

DESY Group

CFEL-CMI

Special Qualifications:

experience in machine learning and Python programming, good knowledge of mathematics

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