

A short Introduction to Open Quantum Systems

From master equations to exact numerical methods

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Partially based on:

- Ahsan Nazir's Lecture Notes on Open quantum systems
https://workspace.imperial.ac.uk/people/Public/anazir1/open_systems_notes.pdf
(https://workspace.imperial.ac.uk/people/Public/anazir1/open_systems_notes.pdf)
- "The theory of open quantum systems" by H.-P. Breuer and F. Petruccione.
- Robert Johansson's series of Lectures on QuTiP
<https://github.com/jrjohansson/qutip-lectures>
(<https://github.com/jrjohansson/qutip-lectures>)
- Uses QuTiP <http://qutip.org/> (<http://qutip.org/>)

Outline:

Part 1

- Motivation: from quantum optics and physical chemistry to quantum technologies
- The Lindblad Master equation; a quick derivation

Part 2

- QuTiP examples and applications
 - Direct integration
 - Monte-Carlo simulation

Part 3