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NITheCS Webinar
Friday, 25 March 2022, 14h00 – 15h00 SAST

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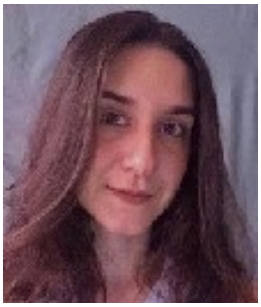
'Approximating Invertible Maps by Recovery Channels: Optimality and an Application to Non-Markovian Dynamics'



ABSTRACT

In this work, we investigate the problem of reversing quantum evolutions, focusing on typical decoherence channels, such as dephasing, depolarising and amplitude damping. We illustrate how well a physical implementable recovery map simulates an inverse evolution. We study optimal recovery strategies for these one-qubit channels, exploring the Petz maps. As an application, we extend this idea to explore the use of recovery maps as an approximation of inverse maps, in the context of non-Markovian dynamics. We show how this strategy attenuates non-Markovian effects, such as the backflow of information. This analysis opens a path for experimental implementations of non-Markovian dynamics, and for the use of non-Markovianity in the context of hiding and retrieving information.

Keywords: Invertible maps, quantum channels, recovering maps, NM dynamics.

BIOGRAPHY

Lea Lautenbacher is a PhD Student at the Institute for Theoretical Physics, Ulm University, Germany. Where she works in the field of Open Quantum Systems and Quantum Information Theory, specifically, she studies Quantum Thermodynamics applied to the development of Quantum Biology.

She finished her Bachelor degree in 2018 and her Masters in Physics in 2021 at the Federal University of Pernambuco in Brazil.

Besides Physics, she is also interested in gender and diversity studies in academia.

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