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National Institute for Theoretical and Computational Sciences

NITheCS Webinar
Friday, 02 July 2021, 14h00

Dr Daniel Burgarth | Macquarie University, Sydney

"Eternal Adiabaticity and KAM-Stability"

ABSTRACT

We develop approximations to a perturbed quantum dynamics beyond the standard approximation based on quantum Zeno dynamics and adiabatic elimination. The effective generators describing the approximate evolutions are endowed with the same block structure as the unperturbed part of the generator, and their adiabatic error is "eternal" - it does not accumulate over time. We show how this gives rise to Schrieffer-Wolff generators in open systems. When considering conserved quantities of an unperturbed system, these approximations provide a version of the celebrated Kolmogorov-Arnold-Moser (KAM) theorem in classical mechanics for finite dimensional quantum dynamics. [Based on Phys. Rev. Lett. 126, 150401 (2021) and Phys. Rev. A 103, 032214 (2021)

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