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Reachability and Observability in Quantum Systems Theory: Aspects of a Unified Lie Frame

Wednesday, August 28, 2024 2:00 PM (1 hour)

Among the questions arising in quantum engineering there is a pair of practical yet fundamental ones: for a controlled quantum dynamical system, (1) what is the reachable set of sates given an initial condition?(2) For which observables (or more generally POVMs) can measurements give full information for system identification? In finite-dimensional closed systems, a unified (Lie) frame of quantum systems theory settles these reachability and observability problems—as will be illustrated in paradigmatic n-qubit systems. Implications and generalisations will be outlined as well.

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