

CHAPTER OVERVIEW

6: Evolution of Open Quantum Systems

We have considered mixed states, where the experimenter has incomplete information about the state preparation procedure, and we have also seen that mixing arises in a system when it is entangled with another system. The combined system can still be pure, but the subsystem has become mixed. This phenomenon arises often when we want to describe systems that have some interaction with their environment. The interaction creates entanglement, and the system taken by itself evolves from a pure state to a mixed state. Such a system is called “open”, since it can leak quantum information to the environment. The theory of open quantum systems revolves around the so-called Lindblad equation.

[6.1: The Lindblad Equation](#)

[6.2: Positive and Completely Positive Maps](#)

[6.3: Bra Vectors and the Inner Product](#)

[6.4: Normalization and Orthogonality](#)

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[6.5.1: Propagating Amplitudes](#)

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