Quantum Zeno Effect

Survival probability in a simple toy model (Rabi oscillations):

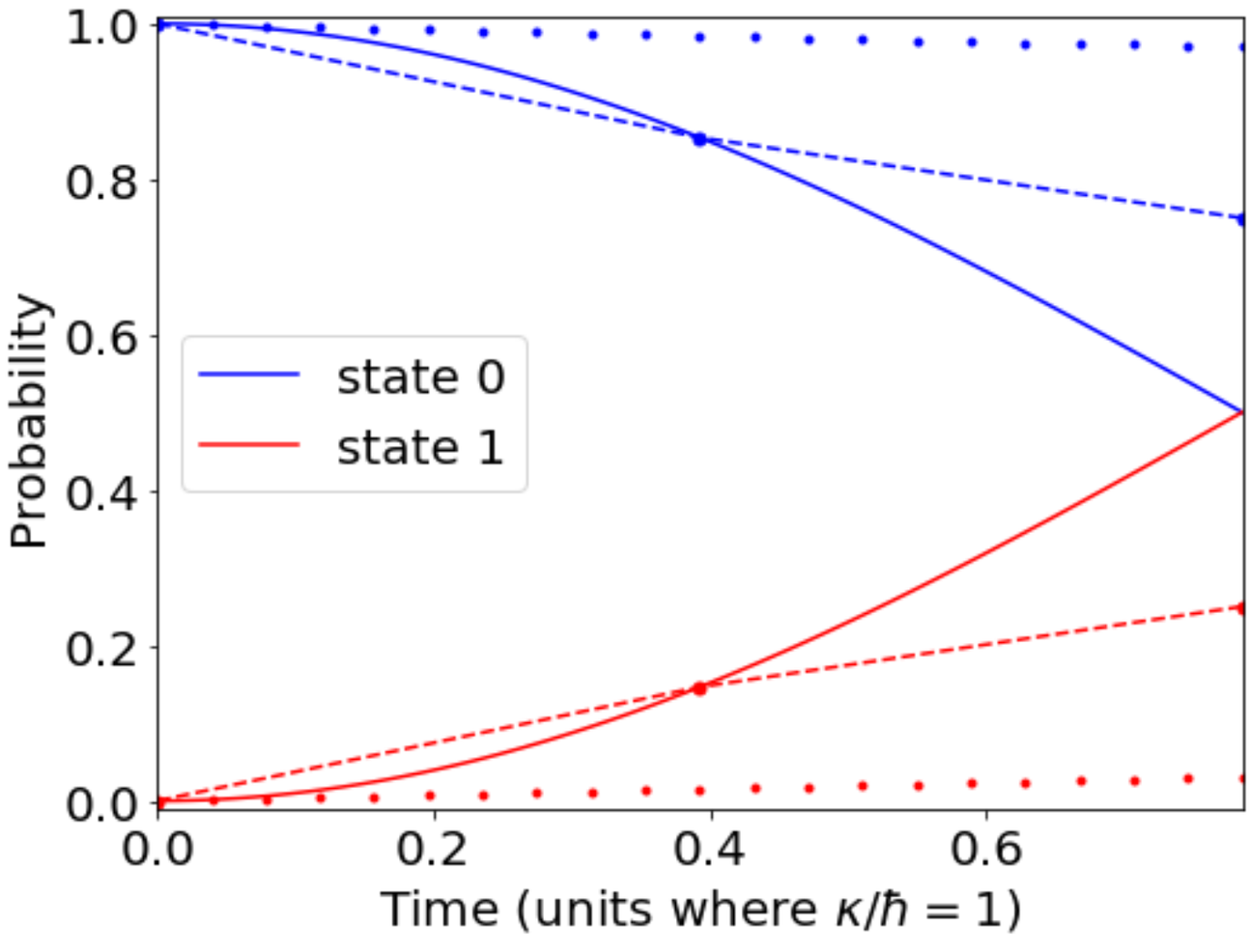
$$\hat{H} \doteq \begin{pmatrix} 0 & \kappa \\ \kappa & 0 \end{pmatrix} \qquad P_{00}(t) = \left| \left\langle 0 \middle| e^{-i\hat{H}t/\hbar} \middle| 0 \right\rangle \right|^2 = \cos^2(\kappa t)$$

Key to QZE: Collapse of wavefunction resets clock

Measure once, at time *t*: 50%

First intermediate measurement follows predicted curve

Second does not! The clock was reset: quantum Zeno effect



Alice

Bob

Bob can reflect Alice’s light back to her. By either choosing to reflect or not to reflect, Bob can encode a message.

If Bob does not reflect, Alice deduces information from the lack of signal. This is a (classical) counterfactual.