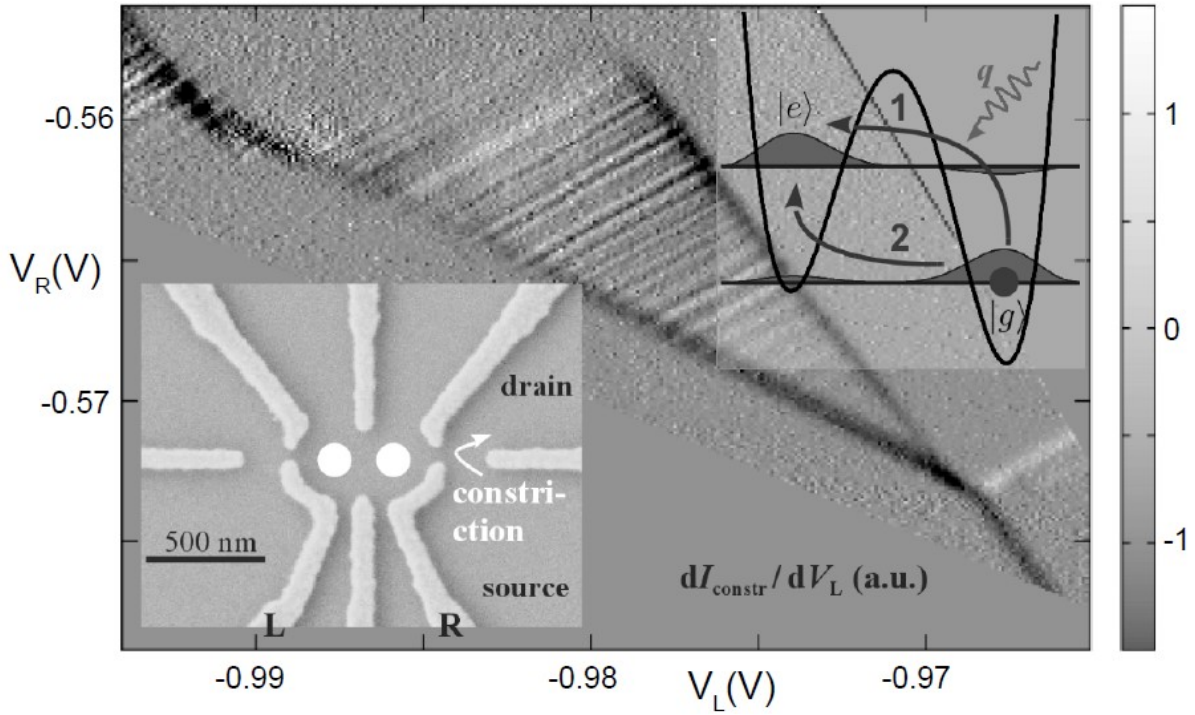
Lecture 2 - Continuous Quantum measurements: Diffusion and Jumps

A. N. Jordan

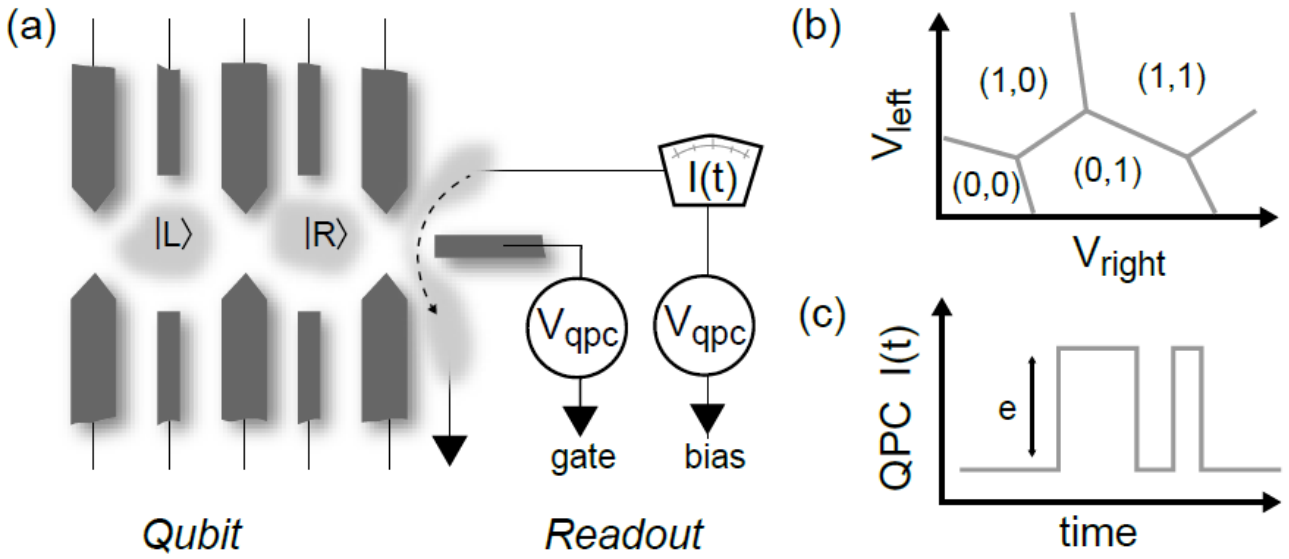
Repeated weak measurements give rise to a stochastic process. I will introduce both diffusive and quantum jump trajectories of monitored quantum systems. Physical realizations of continuous monitoring will be given, motivating the mathematical description of quantum state collapse as a stochastic differential equation or stochastic path integral. Comparisons with experimental data will be discussed.

Lecture 2 - Figure 1



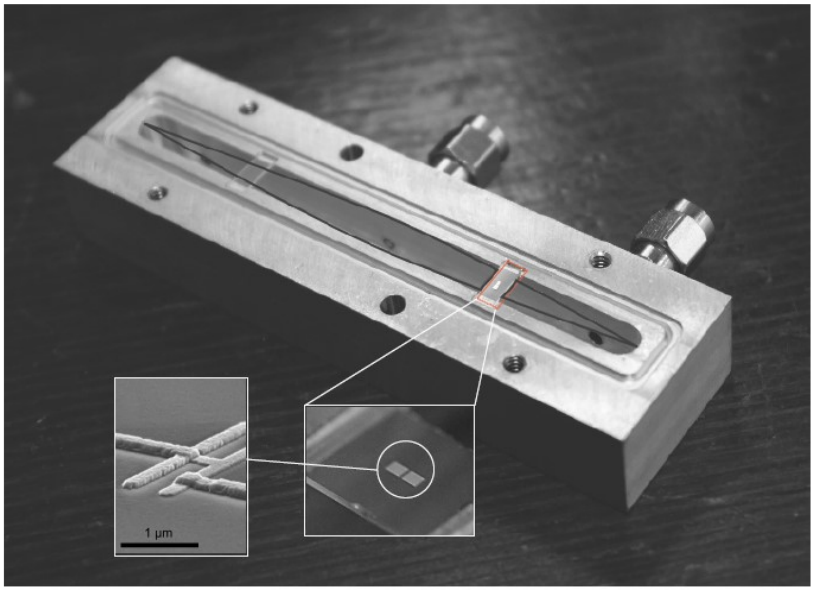
Granger et al. (2012). Adapted with permission from Nature Publishing Group

Lecture 2 - Figure 2



Lecture 2 - Figure 3

(a)



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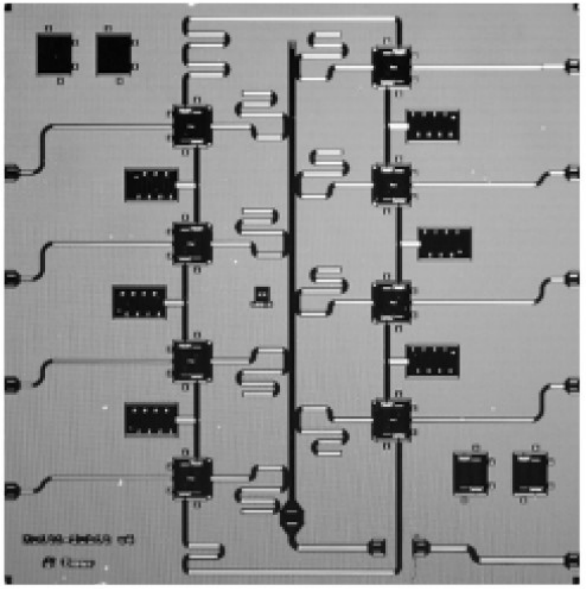
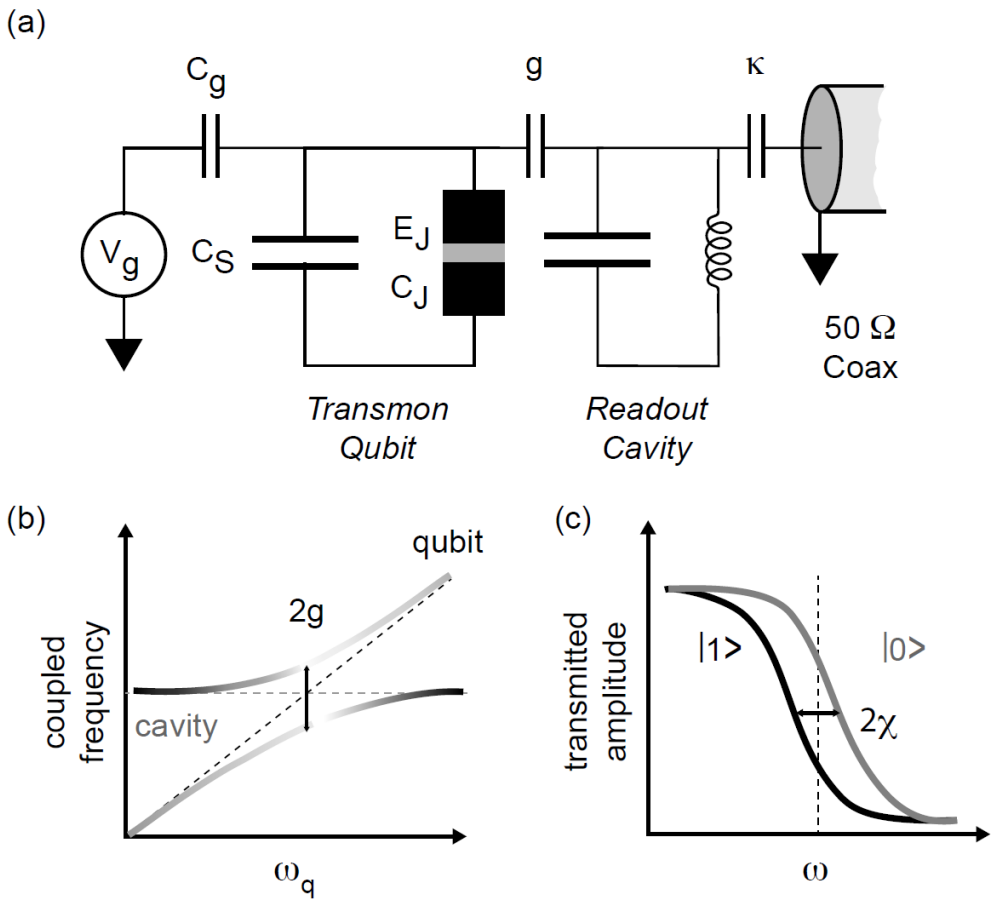
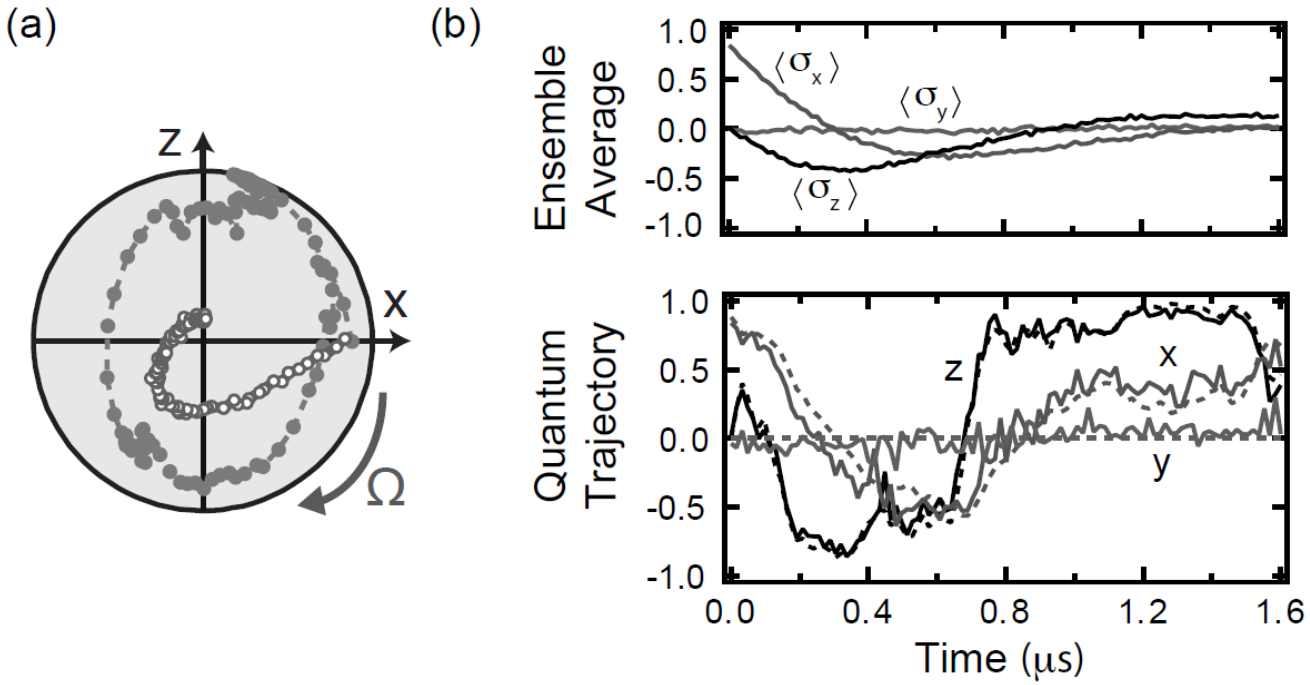


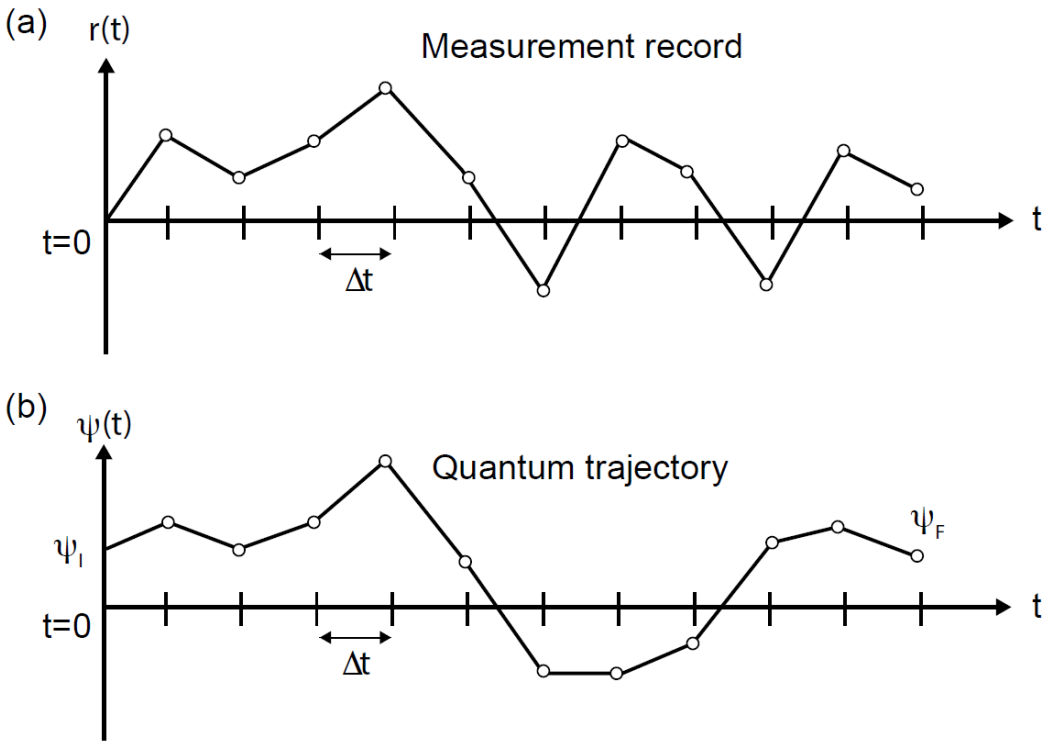
Lecture 2 - Figure 4



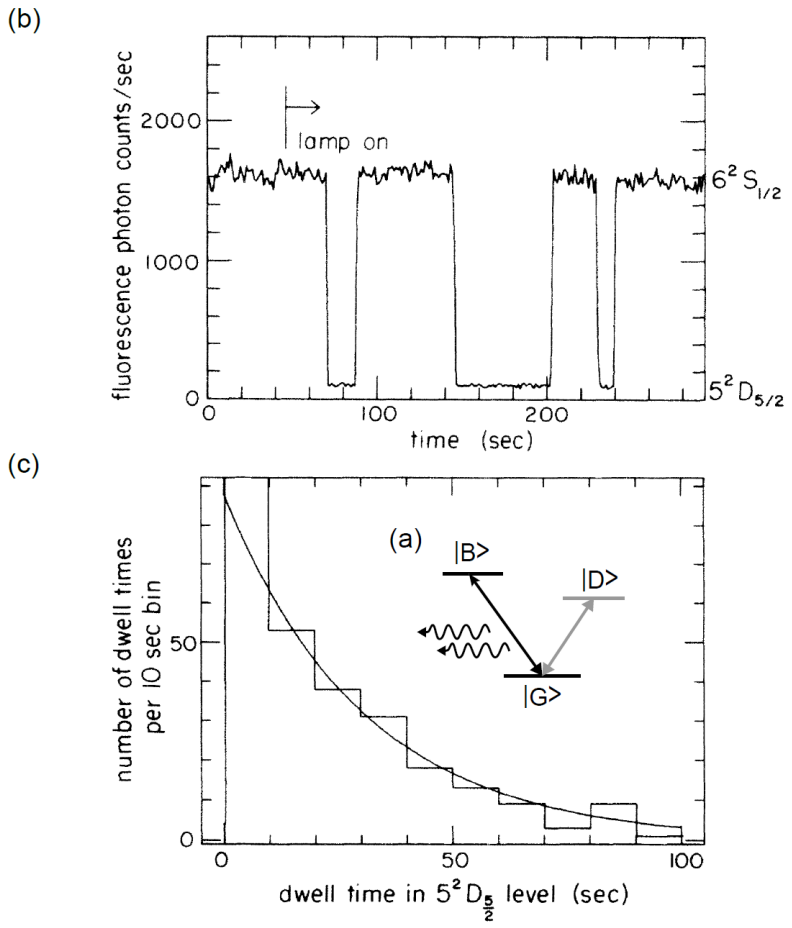
Lecture 2 - Figure 5



Lecture 2 - Figure 6

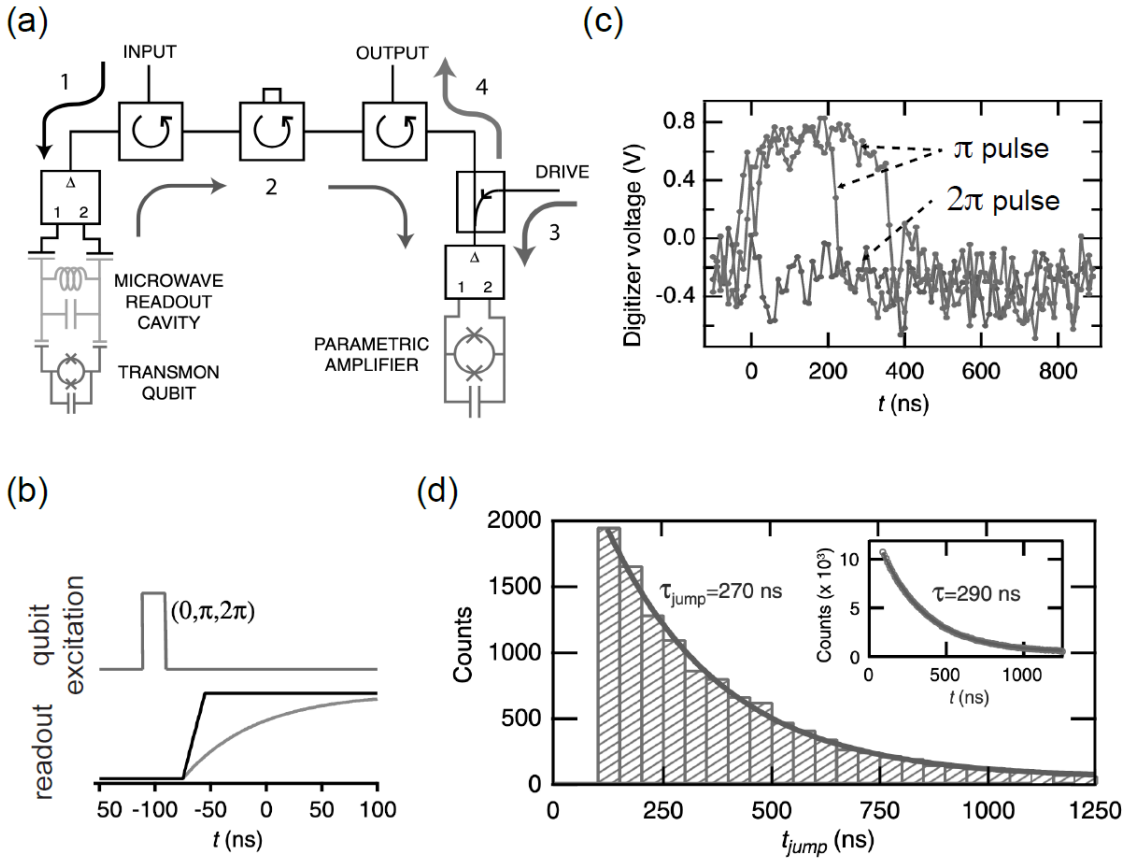


Lecture 2 - Figure 7



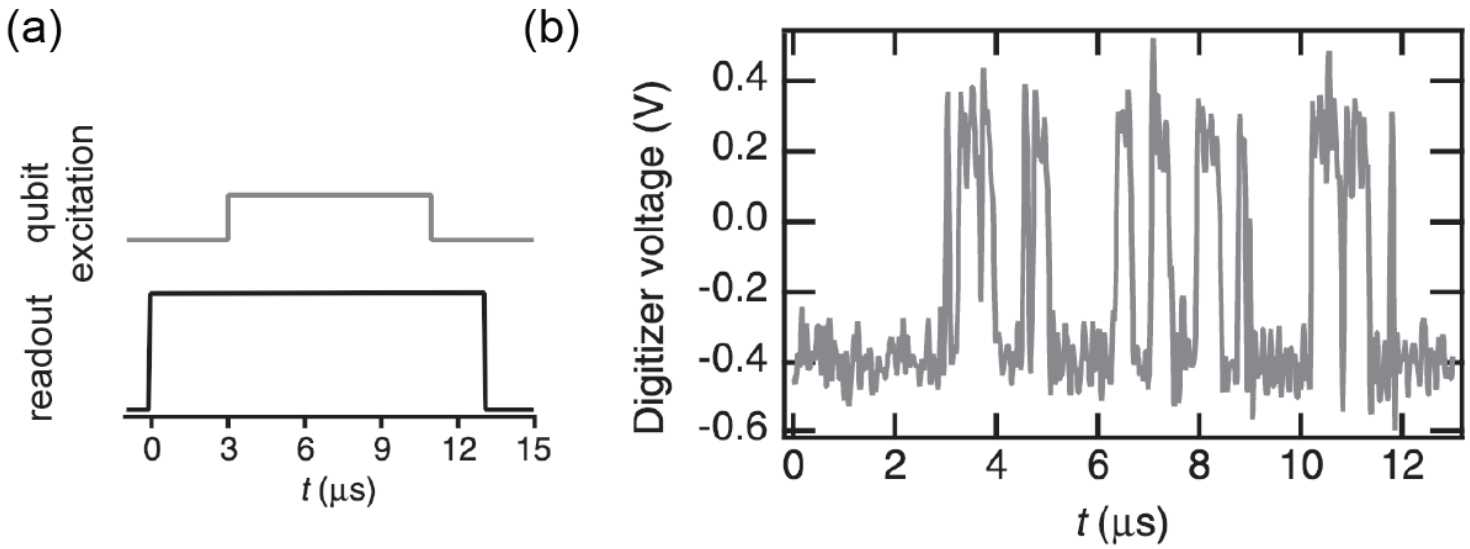
[Nagourney et al. (1986)]. Reproduced with permission from the American Physical Society.

Lecture 2 - Figure 8



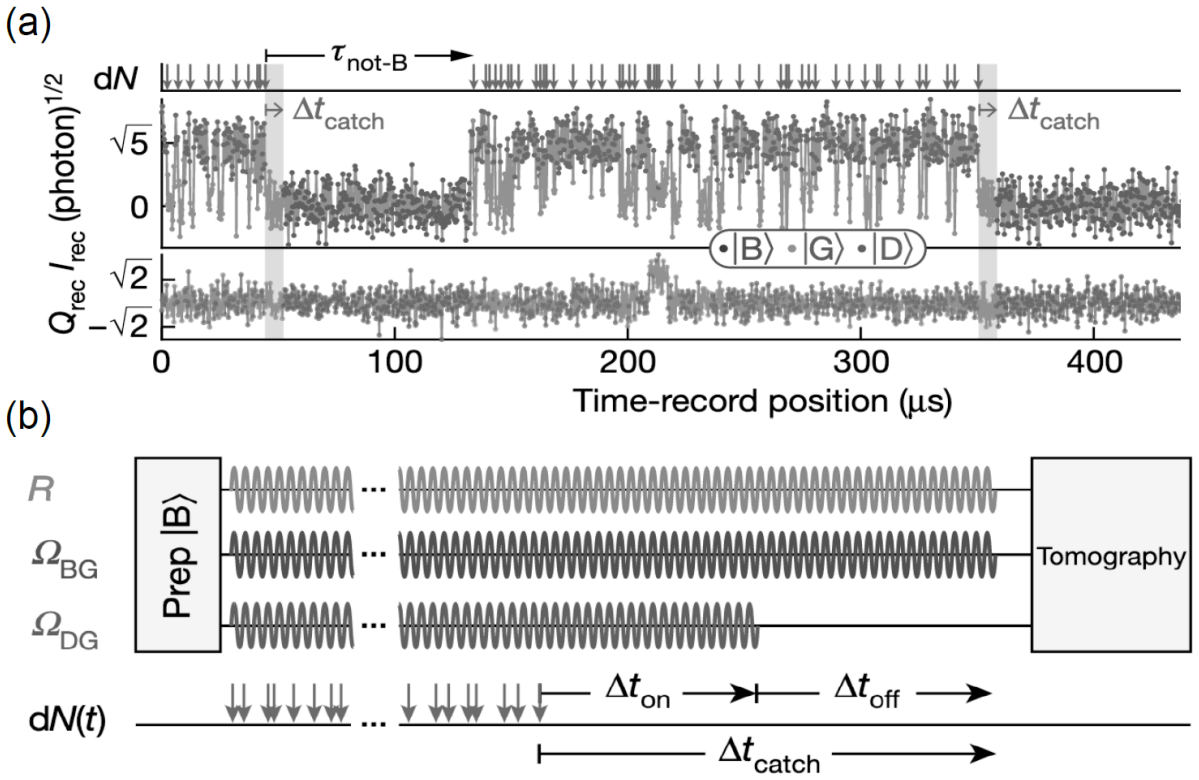
[Vijay et al. (2011)]. Adapted with permission from the American Physical Society.

Lecture 2 - Figure 9



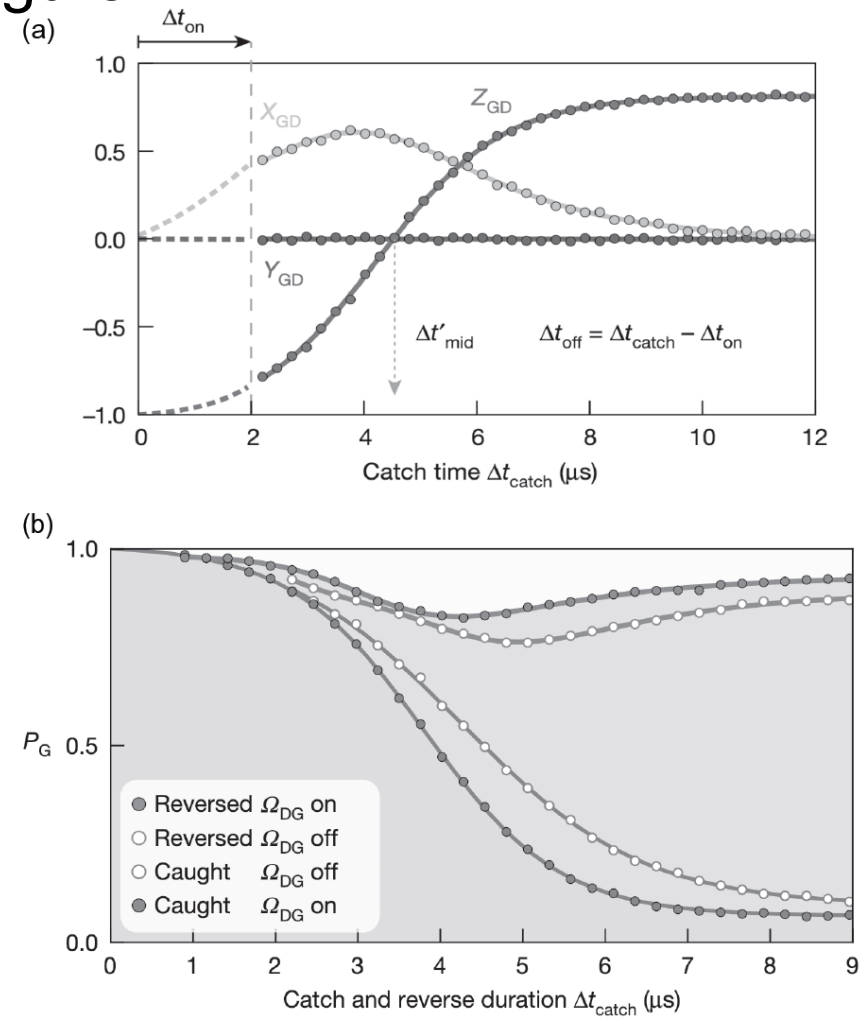
[Vijay et al. (2011)]. Adapted with permission from the American Physical Society.

Lecture 2 - Figure 10



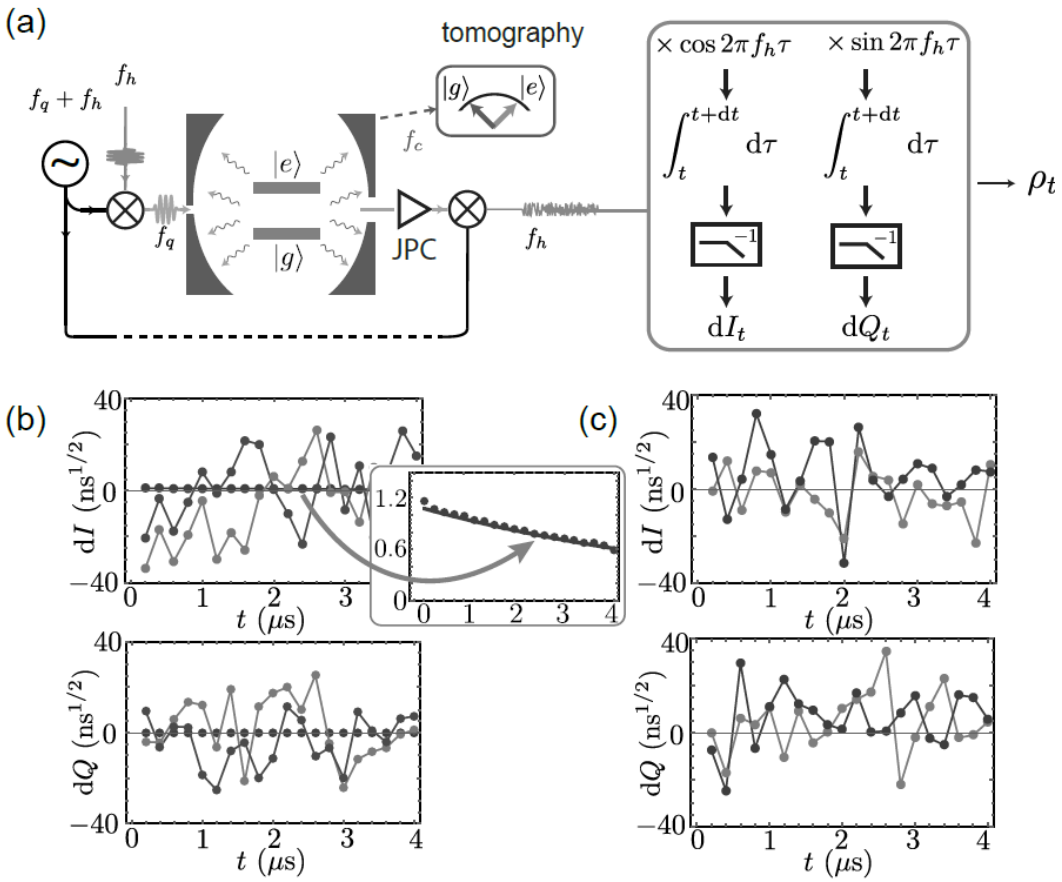
[Minev et al. (2019)]. Adapted with permission from the Nature Publishing Group.

Lecture 2 - Figure 11



[Minev et al. (2019)]. Adapted with permission from the Nature Publishing Group.

Lecture 2 - Figure 12



Campagne-Ibarcq et al. (2016)].
Adapted with persmission from the American Physical Society.

Lecture 2 - Figure 13