SuperLab Spring 2024

April 24, 2024

Lab #6

We will be measuring a qubit in the time domain. The qubit is at a frequency of 6.0 GHz. The resonator is at a frequency of 7.4 GHz.

1. Send two pulses, one after another. Map the drive (first) pulse to AWG 3 Ch. 2 and the readout (second) pulse to AWG 3 Ch.1
2. Find when the readout pulse starts.
3. Now vary the readout frequency between 7.405 and 7.42 GHz. Describe the response of the resonator.
    a. Fit the response to a decaying sine and find the time constant of the decay
        i. This is the hopping rate of photons going into the resonator
4. Compare this response with the drive on and off.
    a. Do you see a difference?
5. If so, vary the time between pulses. Plot the voltage measured versus the delay time and fit it to an exponential. This would give you the qubit T1 time.