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Dynamics of dispersive single qubit read-out in circuit QED R. BIANCHETTI, S. FILIPP, ETH QUANTUM DEVICE TEAM, ETH Zurich, A. BLAIS, Université de Sherbrooke, A. WALLRAFF, ETH Zurich — In a circuit quantum electrodynamics setup the qubit state is inferred from the response of the coupled qubit-cavity system to a microwave signal applied close to the cavity resonance. We experimentally investigate the frequency dependence of the response for both weak continuous and pulsed measurement signals. We find excellent agreement with theoretical predictions from a generalized Jaynes-Cummings model which includes dissipation and dephasing. The quantitative understanding of the system response is used to optimize the measurement frequency maximizing the signal-to-noise ratio. This allows for an accurate determination of the qubit excited state population from the measured field response.

- Prefer Oral Session
 Prefer Poster Session

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