rf-reflectometry measurements of a Josephson junction oscillator circuit at milliKelvin temperatures


We report on rf-reflectometry measurements on a Nb/AlOx/Nb Josephson junction tank circuit. The junction has nominal critical current of $5 \mu A$ and is loaded with an on chip capacitance of 50 pF to suppress the plasma frequency to $f_p \approx 2$ GHz. Measurements were performed at temperature $T \approx 100$ mK in a dilution refrigerator. Reflection data show a clear rf absorption resonance and concomitant phase change about the resonant frequency. We will discuss use of this circuit for state readout of a phase qubit and as a device for measuring critical current noise in Josephson junctions.

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