

# Niobium Coax Cavity Data

The raw data of all measurements leading to the results of the paper are collected in the Measurements folder. We analyzed the niobium cavity in the frequency and in the time domain with two measurement setups (see paper). The VNA data is composed of three columns: the real (Real (V)) and imaginary (Imag (V)) part of the reflection scattering parameter S11 at each measured frequency (Freq (GHz)). The Time domain data includes the reflected power values (P\_r (dBm)) at each time step (Time (s)). All formulas needed to analyze the data are presented in the paper or in the supplementary material of the paper.

## Frequency Domain Measurements

The Folder Frequency\_Domain/Power\_Sweep contains VNA data at different cavity drive power levels. The filename of each dataset includes the VNA output power in dBm. The temperature of the environment is kept constant at 20mK.

The Folder Frequency\_Domain/Temperature\_Sweep contains VNA data at different temperatures of the measurement environment. The filename of each dataset includes the temperature. The VNA outputpower is kept constant at -65 dBm.

The Folder Frequency\_Domain/Power\_Sweep\_Aged contains VNA data at different cavity drive power levels of the same cavity after months of aging. The filename of each dataset includes the VNA output power in dBm. The temperature of the environment is kept constant at 20mK.

## Time Domain Measurements

The folder Time\_Domain contains three files with the reflected power values over time while applying a resonant rectangular drive pulse at different power levels to the cavity. The drive pulse power is given in dBm in box brackets in the header of each reflected power data column. Dataset A and Dataset B include the main time domain data at a wider (Maindata\_A) and a finer (Maindata\_B) variation of the drive power. The Data\_Aged file contains the time domain reflected power measurements of the aged cavity.

## Additional Information

The additional measurement line attenuation from the measurement devices to the experiment is specified to -69 dBm. This is needed to convert the VNA output power to an average circulating photon number in the resonator.