Using a Fabry-Perot Semi-Confocal Open Resonator in the RF Range to Measure High-Tc Superconducting Substrates

# Abstract

Will be the last part written to include results and a concise statement of the project.

# Introduction

Superconducting RF cavities and their importance along beam lines such as the APS. Explain their limitations. Compare to the possibilities of finding high-Tc superconducting RF cavities.

## Motivations

Talk about the motivations for needing to do simulations like these to eventually perform tests.

# Methods and Software

## 2.1 Fabry-Parot Semi-Confocal Open Resonator

Explain the eventual decision to use this type of resonator to test the samples.

### Design

Explain parallel-plate configuration versus having a spherical mirror and the gains in doing so. Explain semi-confocal versus hemispherical and why ours is set up in a confocal configuration (plane waves and that it has too much degeneracy at the confocal configuration.)

### Use in a Sample Measurement

The characteristics that specifically make this resonator useful for the measurements we intend to obtain, i.e. Quality factor, temperature readings, etc.

## Computer Simulation Technology-Microwave Studios

Talk about the uses of MWS and its capabilities. Also, specify which parts of the program you’re using mostly, such as the eigenmode solvers to simulate basic pill-box cavities.

# Data and Conclusions

# Acknowledgements