

RF Tests of Dressed 325 MHz Single Spoke Resonators at 2 K

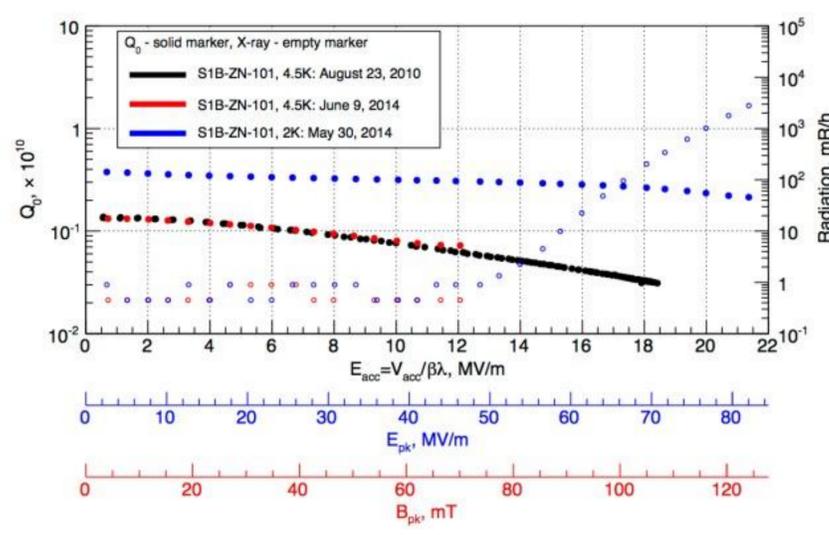
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Fermilab has recently completed an upgrade to its spoke resonator test cryostat to enable testing of cavities in superfluid helium. Two single-spoke resonators with differing helium vessel designs have been tested in this new configuration. Gradient and Q_0 performance was studied along with microphonics control and sensitivity of the resonant frequency to pressure variations. A description of the testing and the results obtained are presented.

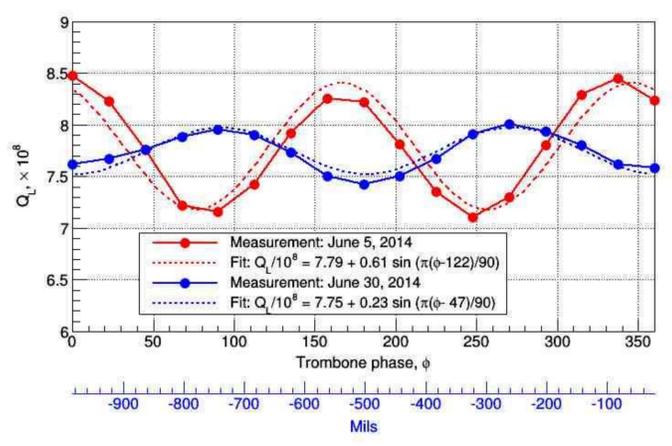
COMMISSIONING OF 2K UPGRADE



Spoke Test Cryostat with new 2 K feedcan

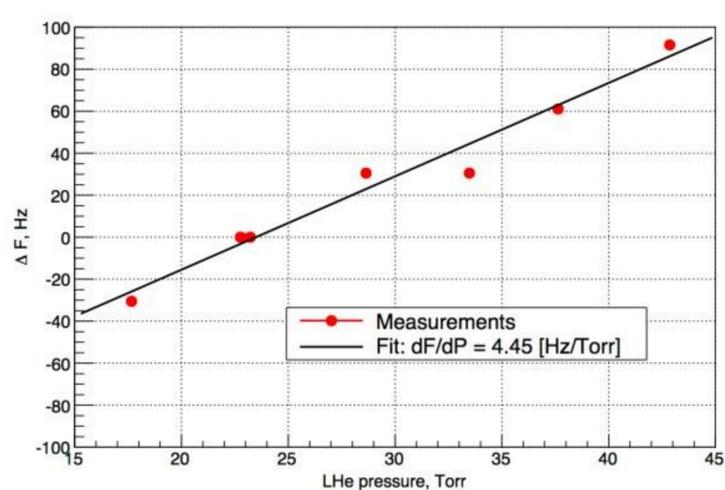


Q_0 vs. E_{acc} curves for commissioning cavity. Data taken at 4.5 K agree well with the cavity's STC data from before the upgrade

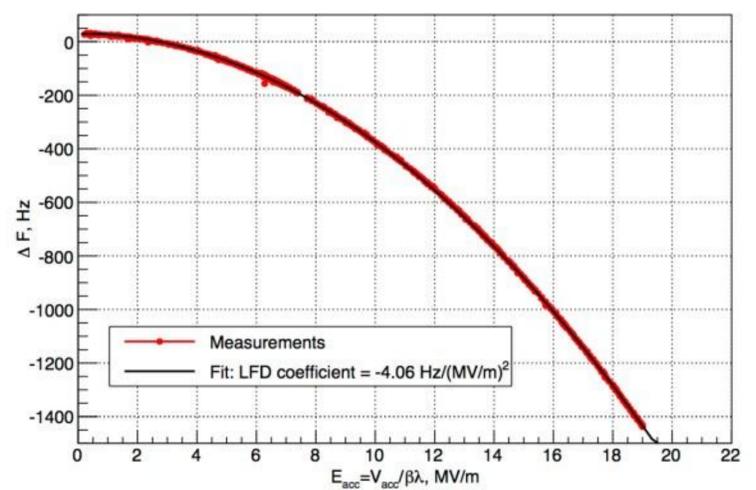


Circulator reflections influence Q_L and can be seen by varying the phase between circulator and cavity. A matching network of phase shifters can reduce this effect.

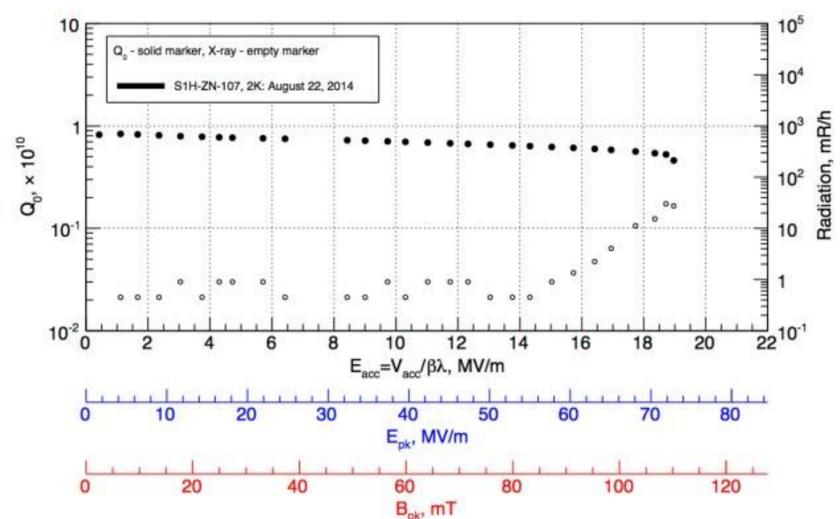
TEST OF CAVITY S1H-NR-107



New helium vessel was designed to minimize df/dP . Measurements agree well with simulation.



Observed Lorentz force detuning



Q_0 vs. E_{acc} curve

CONCLUSION

- STC successfully upgraded and commissioned for 2 K operations
- Cavity S1H-NR-107 meets performance requirements
- New helium vessel design shows expected improved df/dP
- Microphonics compensation studies qualification of additional cavities in the coming year