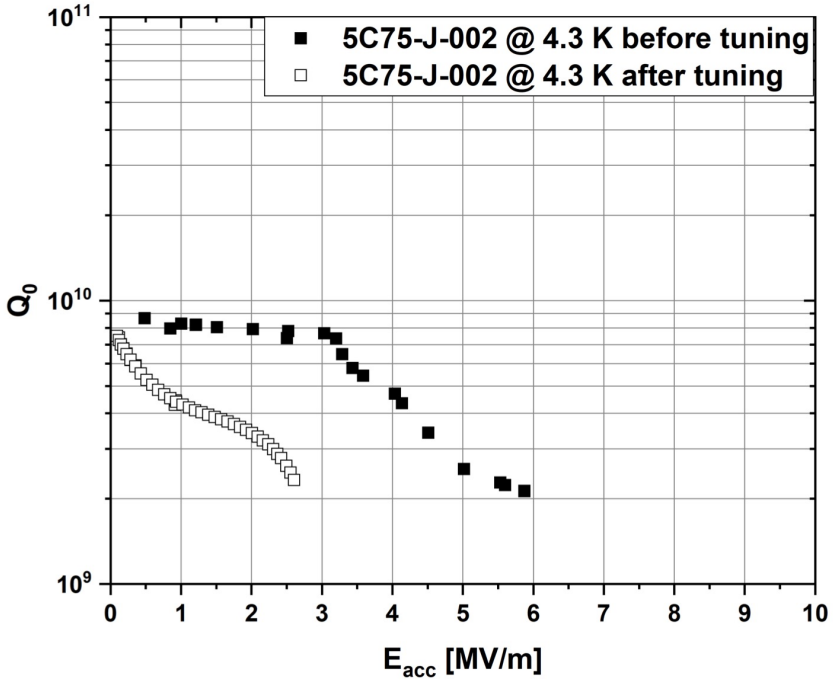
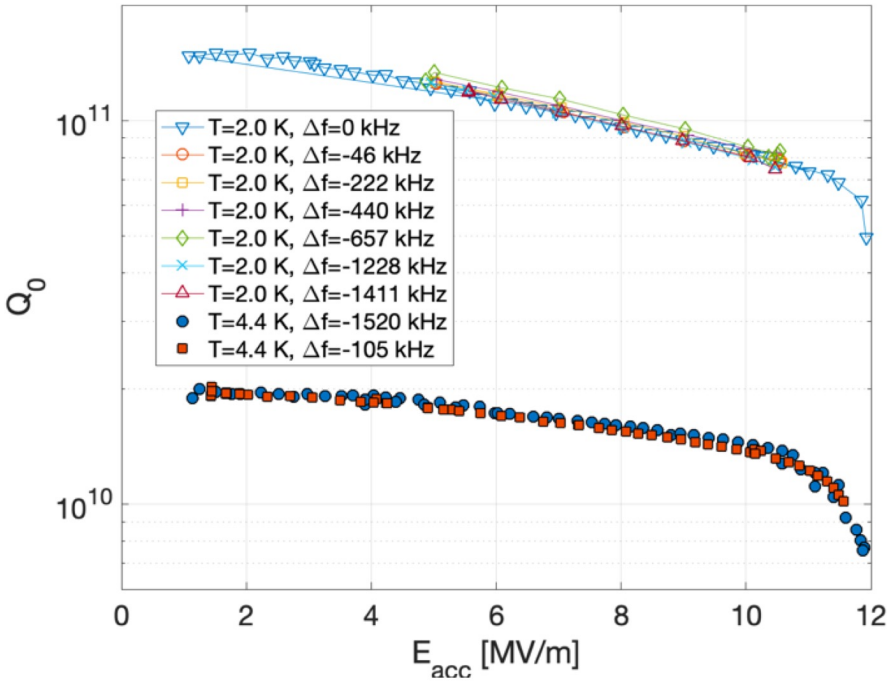
Hot Topic Session: Speaker's List

Cagetory	Name	Institute	Speaker confirmed
• Introduction	Gianluigi Ciovani	JLab	yes
1. Choice of cryocoolers	1a) Tomohiro Yamada	KEK	yes
	1b) Ram Dhuley	FNAL	yes
	1c)Roman Kostin	Euclid Tech.	yes
	1d) Ziqin Yang	IMP	J. Hao
2. Thermal Link design	2a) Neil Stilin	Cornell U.	yes
	2b) Tomohiro Yamada	KEK	yes
	2c) Ram Dhuley	FNAL	yes
	2d) Roman Kostin	Euclid	yes
	2e) Thomas Proslier	CEA-Saclay	yes
3a. Nb3Sn on Cu thin-film performance	3aa) Cristian Pira	INFN	yes
	3ab) Shawn McNeal	Ultramet	yes
3b. Nb3Sn on Nb thin-film performance	3ba) Uttar Pudasaini	JLab	yes
	3bb) Jiankui Hao	PKU	yes
	3bc) Liana Shpani	Cornell	N. Stilin
4. Tunability / robustness of Nb3Sn	4a) Grigory Eremeev	FNAL	yes

Tunability / robustness of Nb_3Sn

Coated cavities can be very sensitive to mechanical deformation





Strong degradation in the coated cavity performance after room temperature tuning for 200 kHz

Little change in the coated cavity performance after tuning up to 1400 kHz at cryogenic temperatures

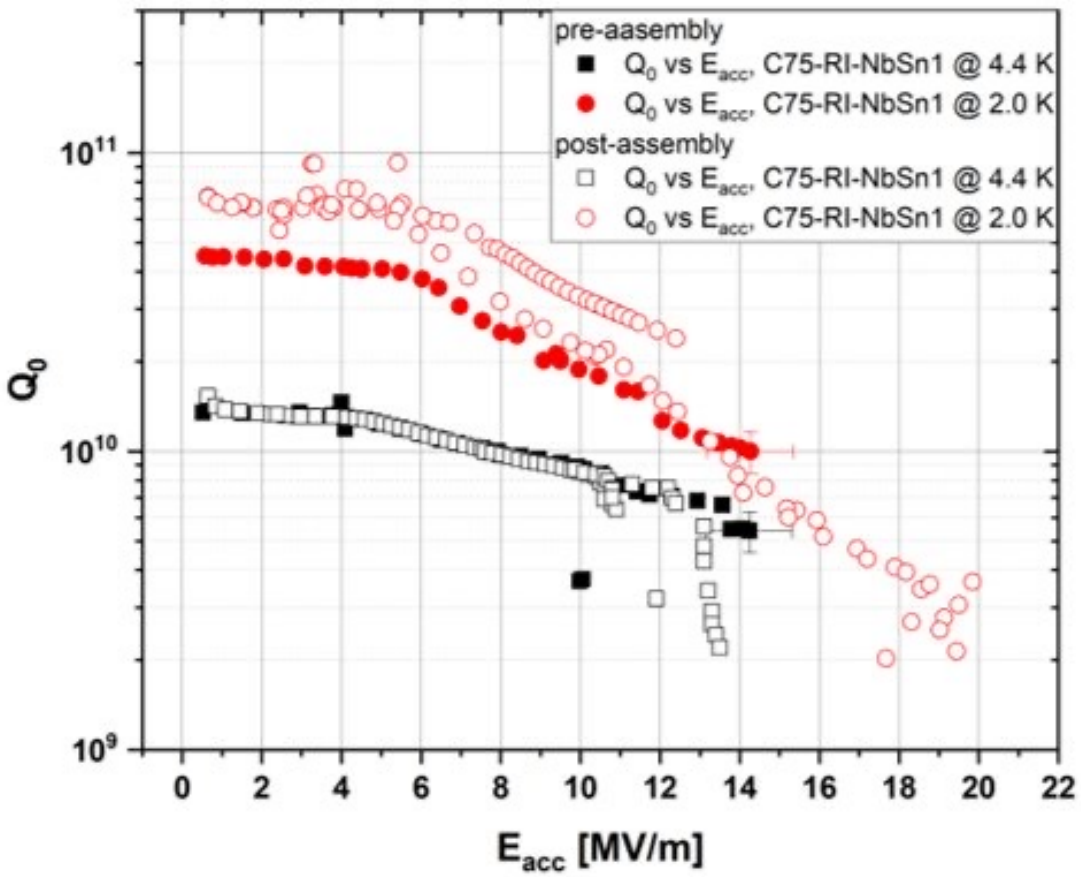
Tunability / robustness of Nb_3Sn

By now we have coated and progress towards string assembly several cavities. Unfortunately, it is not just mechanical tuning to the accelerator frequency on the tuning bench that degrades the performance

Mechanical tuning: increase in surface resistance and field dependence

No mechanical tuning: low field Q is retained, but still strong field dependence

No mechanical tuning & no "pair" test: performance is better retained in one cavity and…



Fermilab

General Discussion

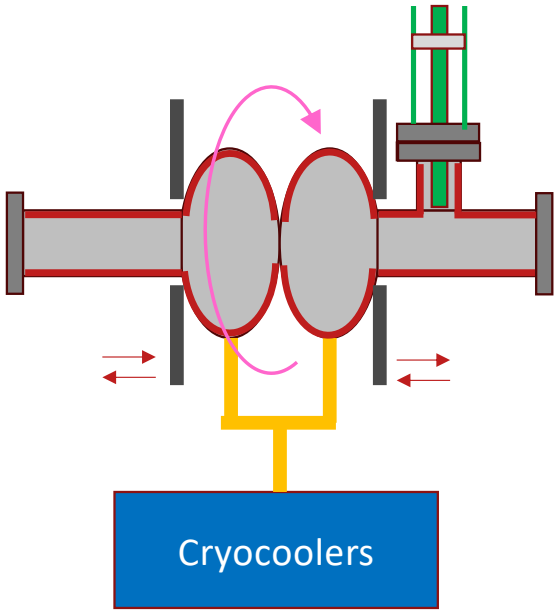
Conduction-Cooled SRF Cavities

- Why conduction-cooled SRF cavities?
  - Eliminate the need for liquid He cryoplants for SRF accelerators, thereby:
    - Reducing footprint
    - Reducing capital cost
    - Simplifying cryomodule design
    - Safer to operate
    - Enabling industrial applications

- Does conduction cooling of SRF cavities work?
  - Use high-quality Nb_3Sn thin films
  - Use commercial cryocoolers with high cooling power at 4 K
  - Single-cell cavities with frequency in the range 0.65 – 2.6 GHz cooled by cryocoolers have been tested up to an accelerating gradient of 10-12 MV/m

Challenges for Conduction-Cooled SRF Cavities

- Choice of cryocooler
  - GM, PT, GM-JT
- Thermal link design
  - Cu, Al, foils, straps, bulk
- Nb_3Sn thin-film performance
  - On Nb: thermal diffusion, magnetron sputtering, electroplating
  - On Cu: CVD, PVD, magnetron sputtering, bronze route
- Tunability of Nb_3Sn-coated cavities
  - Warm, cold
- Low-loss fundamental power coupler
- Thermoelectric magnetic flux



Many thanks
for
the fruitful hot-topic discussion !!