

CM-1 & 2 Status

ILC Cryomodule meeting

27 March 2012

E. Harms/FNAL

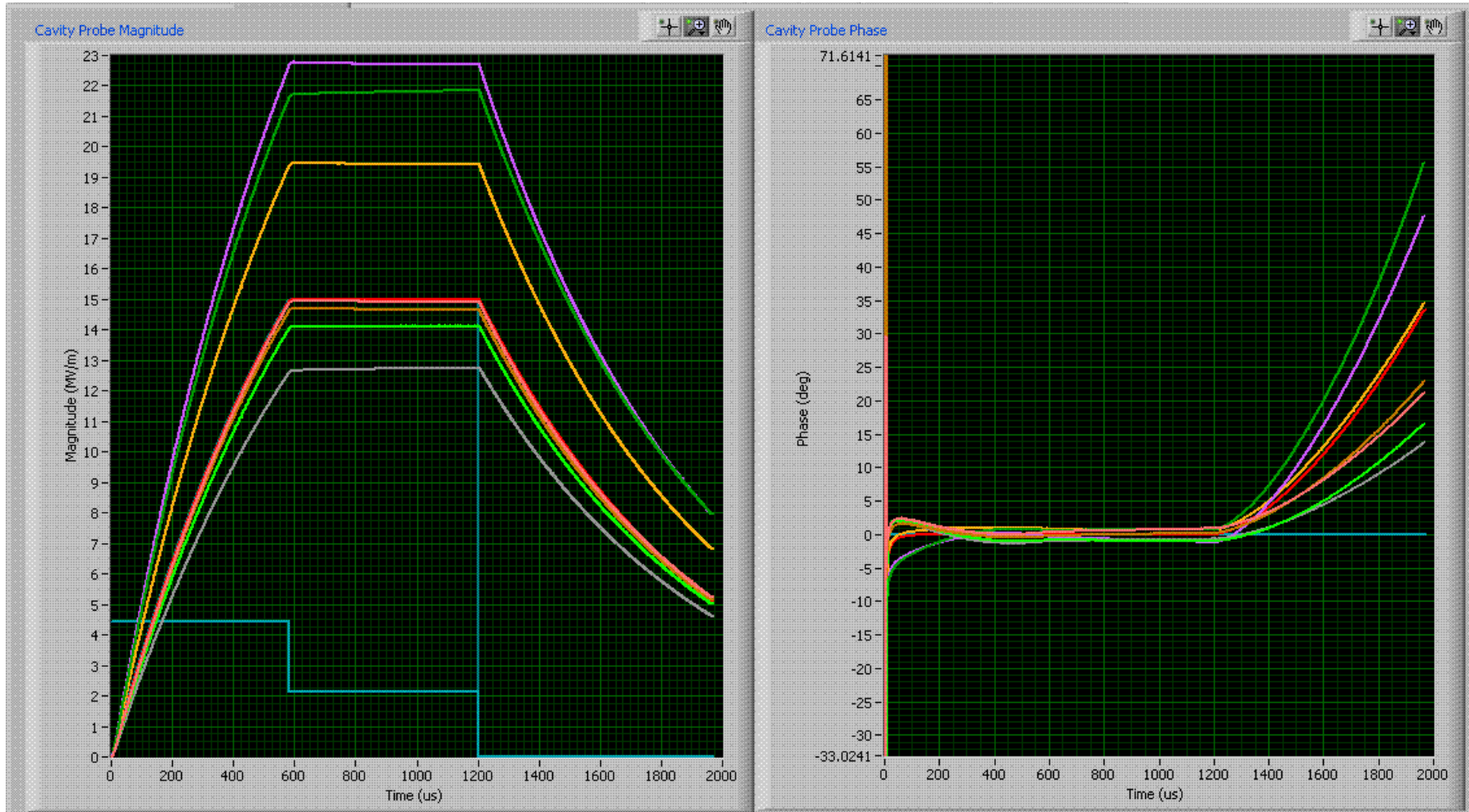
Recent Activity

- CM-1 testing is complete
- Warm-up complete
- Leak check in progress
- Beginning removal
- CM-2 assembly nearly finished

Remaining Work

- Post thermal cycle performance evaluation *complete*
- Dynamic Heat Load measurement of entire module *measurement and analysis complete*
- Localized dosimetry to identify possible source(s) of field emission in Cavity #1 *complete*
- Evaluate cavity to cavity phases *complete*
- Parasitic LLRF and LFDC studies *complete*
- Attempt to identify location of insulating vacuum leak and begin warm-up *in progress*
- Remove CM-1 and prepare to install CM-2 *in progress*
- Strenuous testing of fast (piezo) and slow tuners *did not attempt*

LLRF System Performance

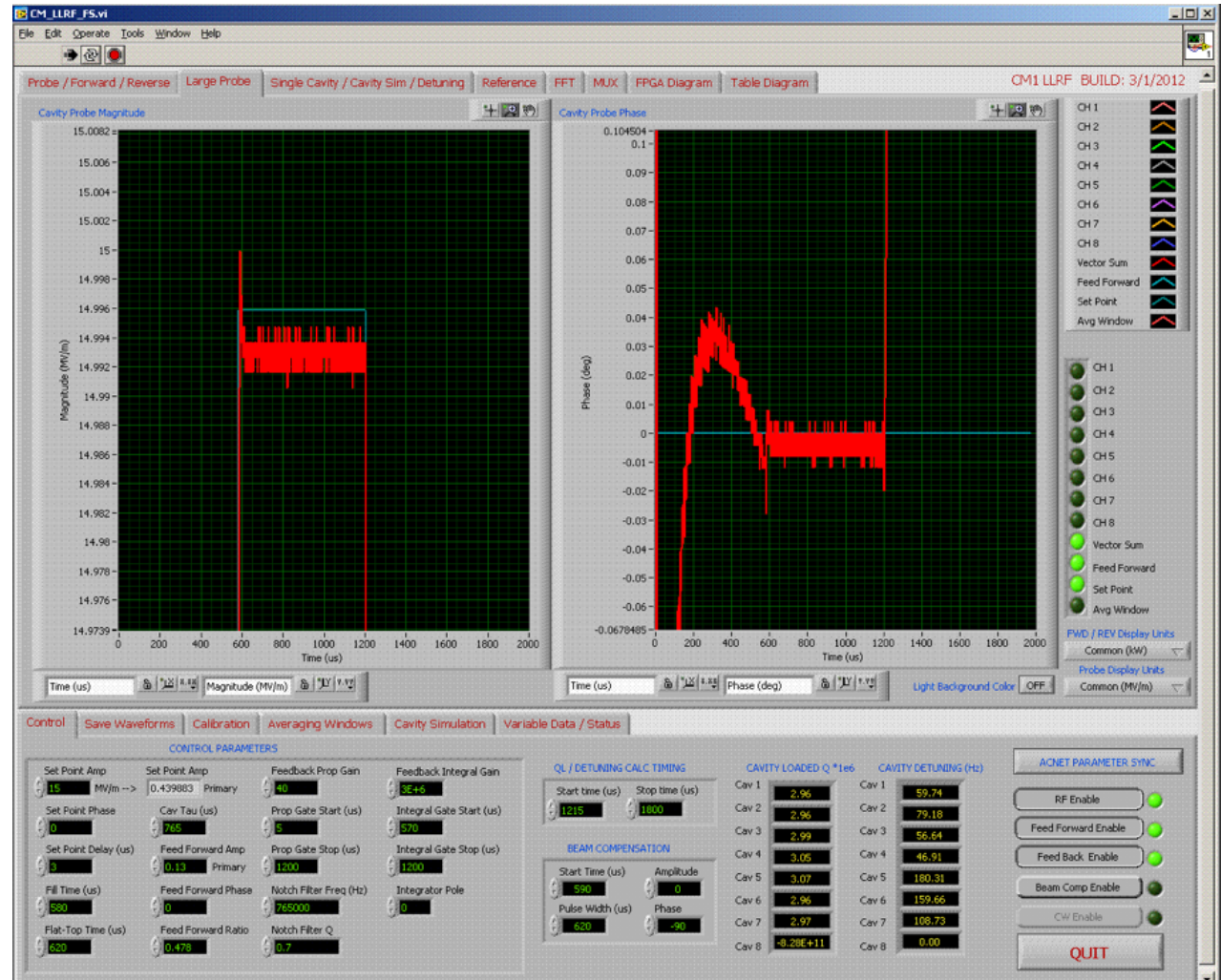


LLRF Feedback ON, LFDC ON

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LLRF System Measurements

- Pulse to Pulse Vector Sum regulation with RF feedback ON and piezo ON.
- 50 Pulses
- Pulse to Pulse RMS magnitude error (%) = $2.5e-4$
- Pulse to Pulse RMS Phase error (deg) = $5.0e-3$



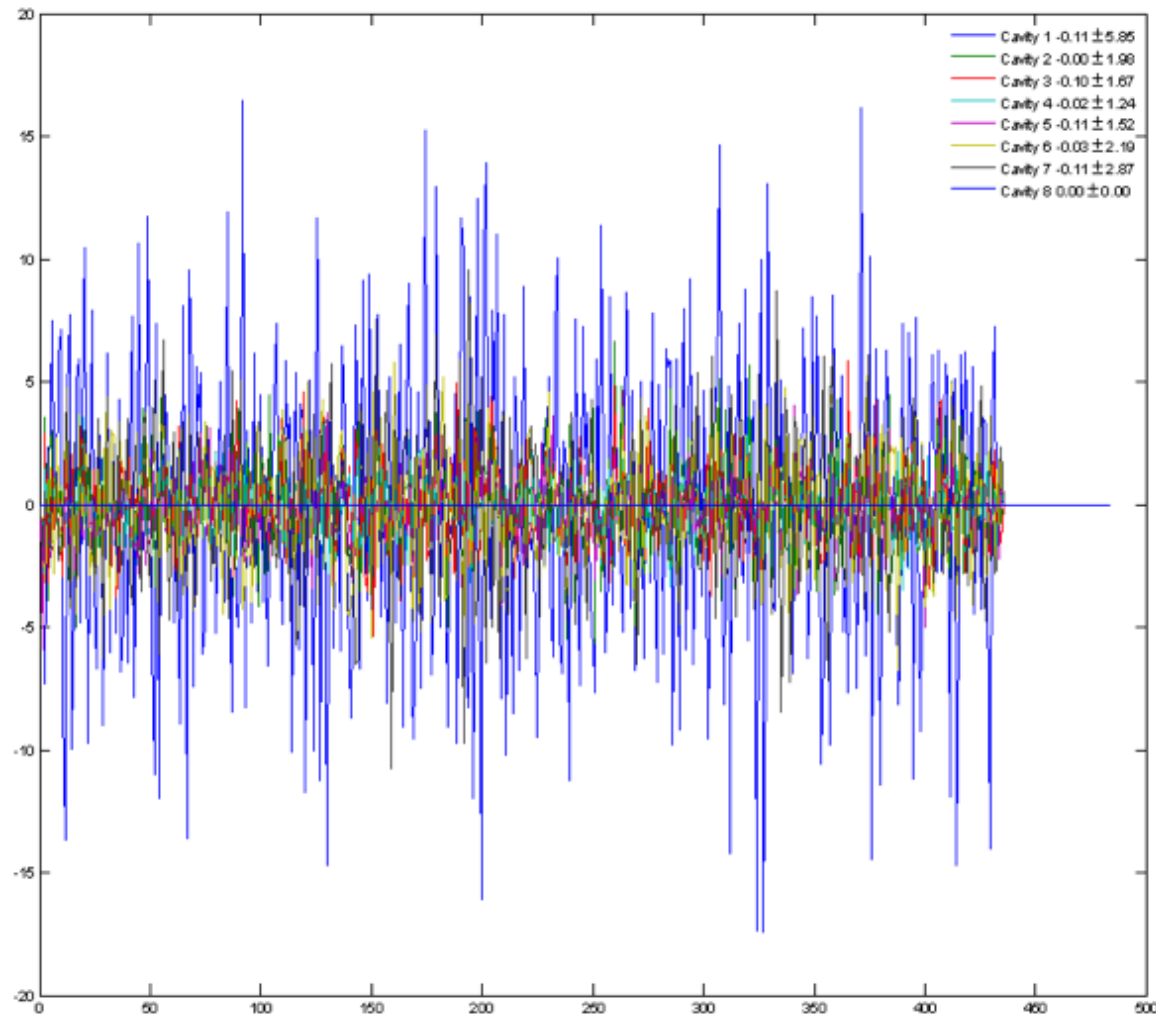
LLRF System Measurements - 2

RF Distribution phase measurements

Cavity	Forward Phase	Transmitted Phase	Δ
1	0	0	0
2	-6.5	-6	-0.5
3	-2	-8	6
4	0	5	-5
5	-12	-12	0
6	-6	-4	-2
7	0	16	-16

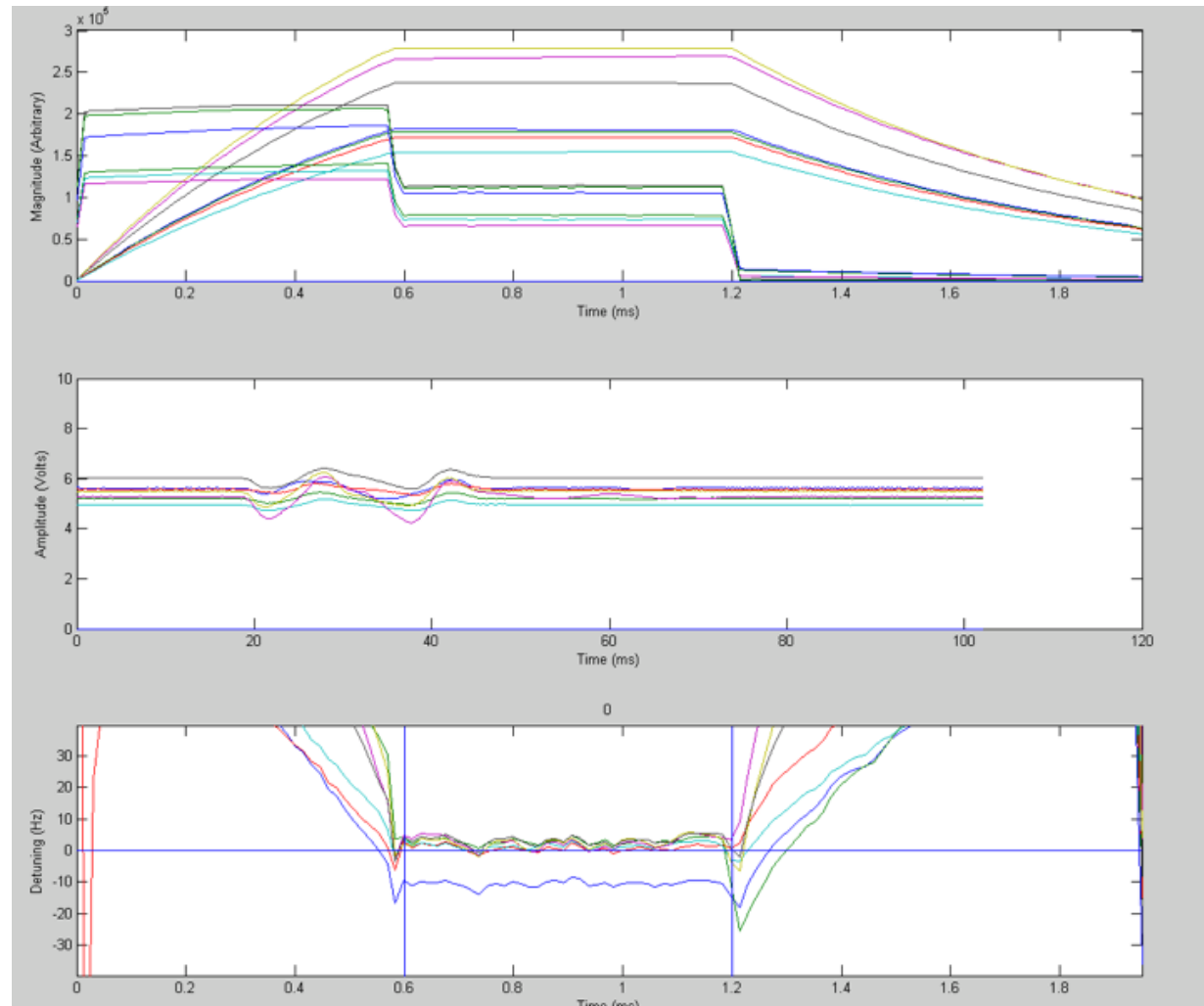
LFDC Short-term Stability

- The number in the stability plot represent the mean and RMS pulse to pulse detuning over all of the pulses in the plot.



LFDC Short-term Stability

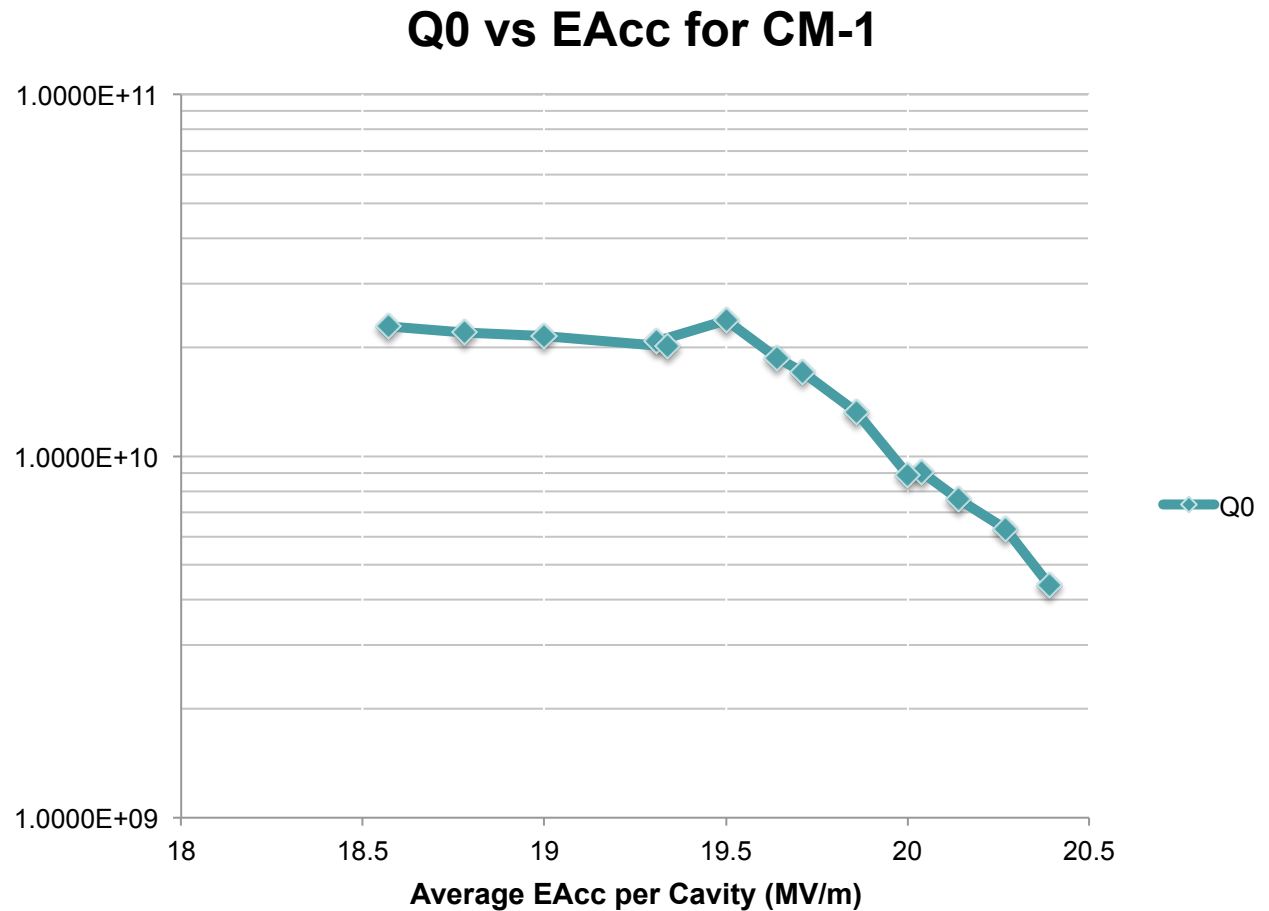
- The second subplot of the screen-shot shows the piezo waveform while the third subplot show the detuning of the cavities



Module Dynamic Heat Load Measurement

- Static Heat Load

- Total ~37 Watts
- CM-1 ~22 Watts
- CC-2 ~15 Watts

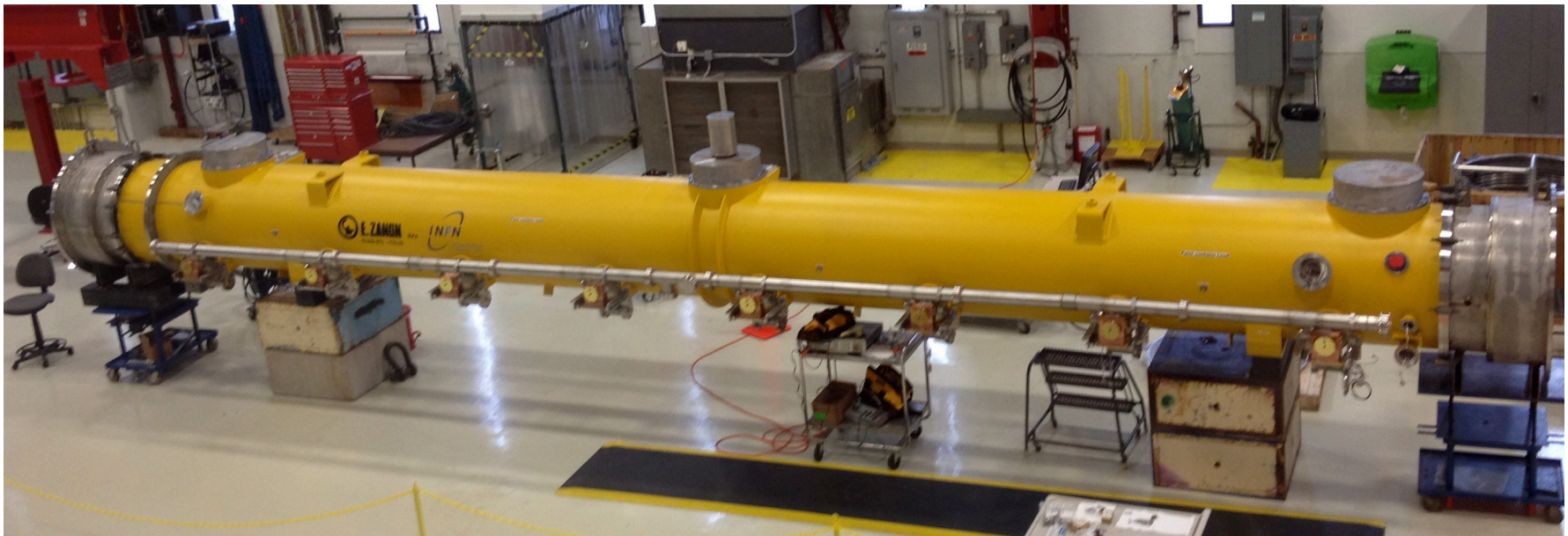


Post Mortem

- Once module is warm and open, inspect:
 - Cavity #2 & #8 tuners
 - Thermal intercepts on Cavities 1, 3, 7, especially HOM cans
 - Piezo on #7 plus possibly others....
 - Cavity #4 coupler – Q_L behavior
 - Some subset of the ‘soft quench’ cavities will be tested at the Horizontal Test Stand
 - a recent cavity under test at HTS is exhibiting similar behavior, further investigation is in progress

CM-2 (RFC A002) Status

- Assembly is largely complete
 - Leak checking, some wiring remains
- Expect CM-2 to arrive at NML mid-April
 - After CM-1 is removed and transported
 - Then bring CM-2 to NML



Thank you for your attention

E. Harms 27 March 2012