Present State Of The EU-Cavity Tests At DELTA

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- Retrospect of the tests in 2004
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Status Quo Presented Last Time:

- Successful insertion, commissioning and operation of the cavity with beam.

  (May 24th - Sep. 9th 2004)
- Due to leakage of one HOM damper, all dampers had been sent to Zanon for revision
- Characterisation measurements pending

What Happened Since Then?

- Jan.7th: Dampers back in house
- Jan.10th: Mount of dampers and heating of cavity until Jan.17th
- since Jan.19th: Check with low level RF (mW and 20 W) gave inconsistent results for coupling factor and Q_0 depending on mechanical stress (vacuum) and temperature.
- Insufficient electrical contact between spacer and damper wall turned out to be responsible for this behaviour.
- May 11th: Replacement of spacers in Damper *T2*, back to original results ($Q_0 \approx 24000$, $\beta = 1.7$)

  problem fixed!

Spacer

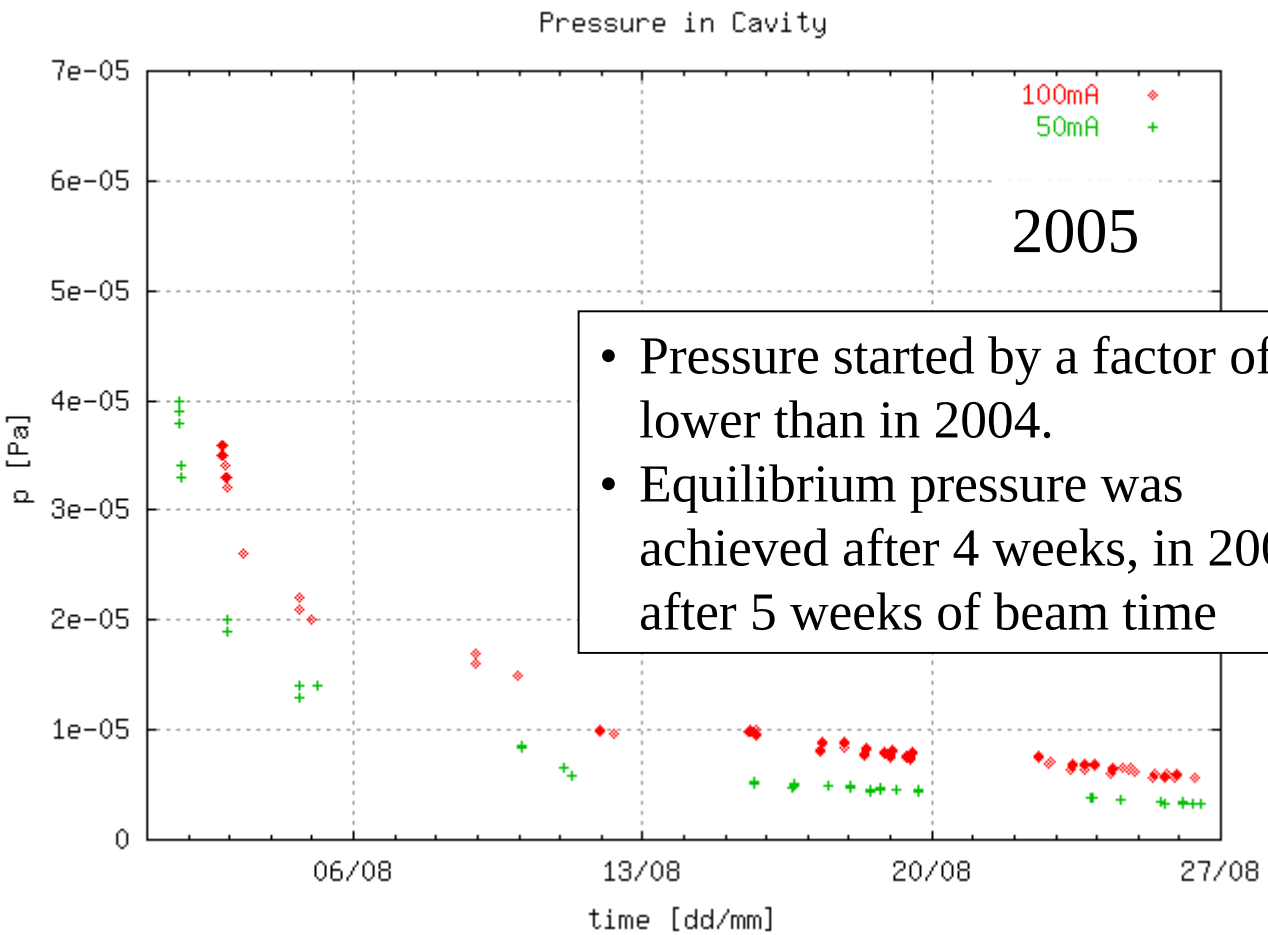

less-than-ideal solution to short circuit transmission line resonator
Next damper generation has a different construction !
See talk by E.Weihreter

What Happened Since Then?

- Insertion: Jun. 28th - Jul 5th.
- Jul.5th: RF conditioning started, 10kW CW reached that day.
- Jul.6th:Threshold at 14kW CW, switch to pulse conditioning. Frequent vacuum bursts (every 20 min), hint for an association to plunger movements.
- Jul.7th: 20kW@95% duty cycle, frequency wobbling to force plunger movement.
- Jul.25th: 20kW CW, number of vacuum bursts reduced.
- Aug.1st: Start of beam operations, I=140 mA were reached on friday
- Aug. 15-19 & Aug. 22-26: user dedicated shifts

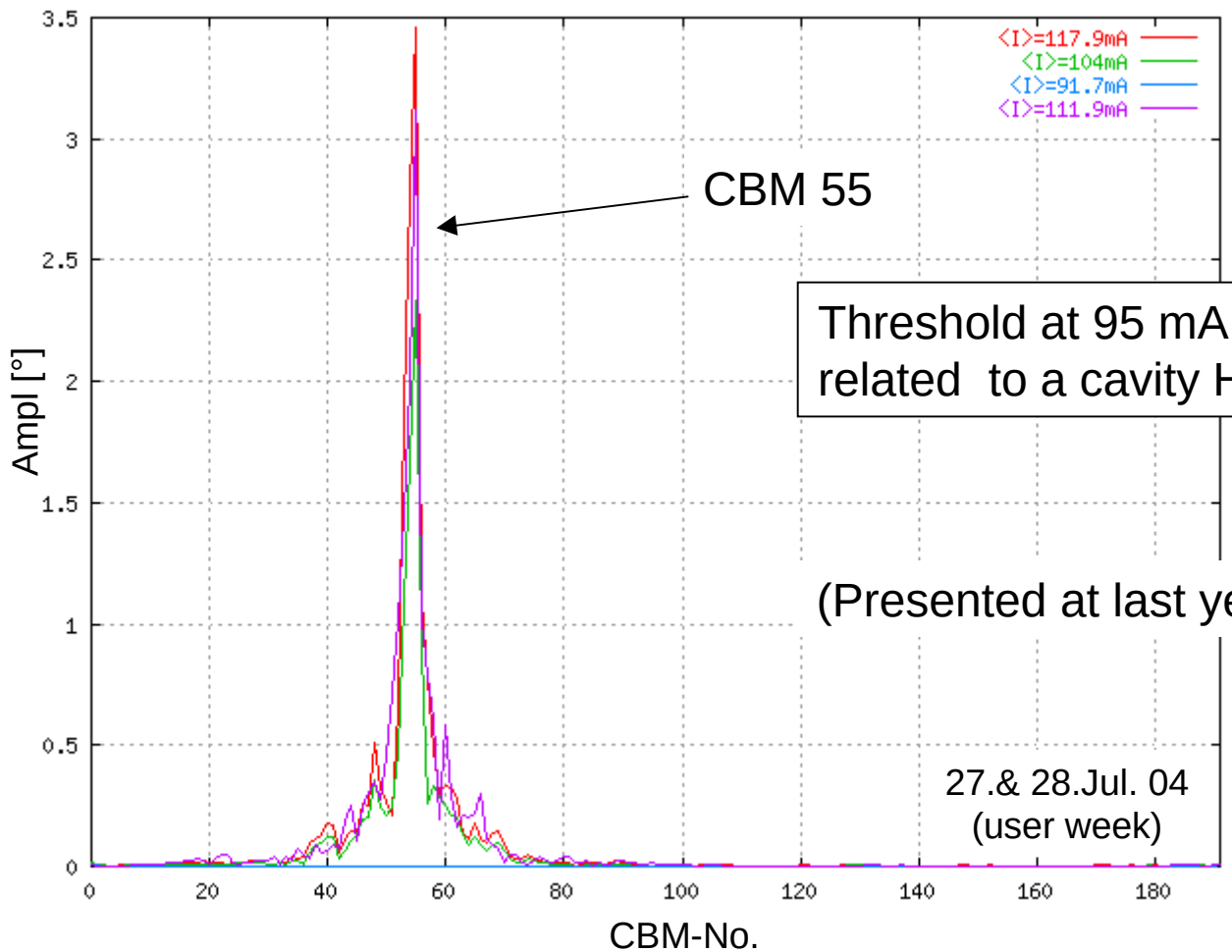
What It Means To Exchange A Cavity!

Pressure Evolution During Operation



- Pressure started by a factor of ~2 lower than in 2004.
- Equilibrium pressure was achieved after 4 weeks, in 2004 after 5 weeks of beam time

First Measurements With The EU-Cavity



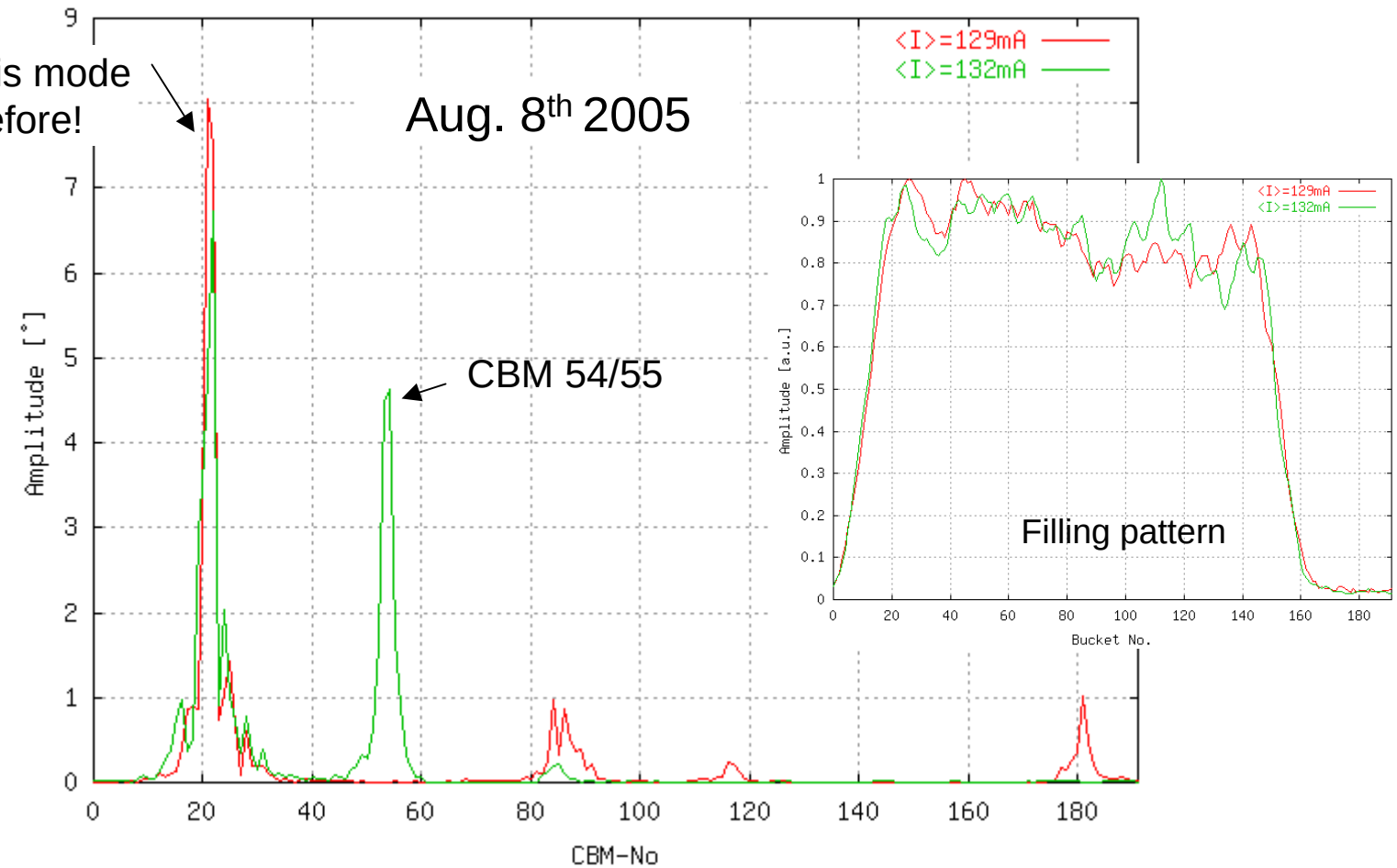
Threshold at 95 mA.
related to a cavity HOM?

(Presented at last year‘s meeting)

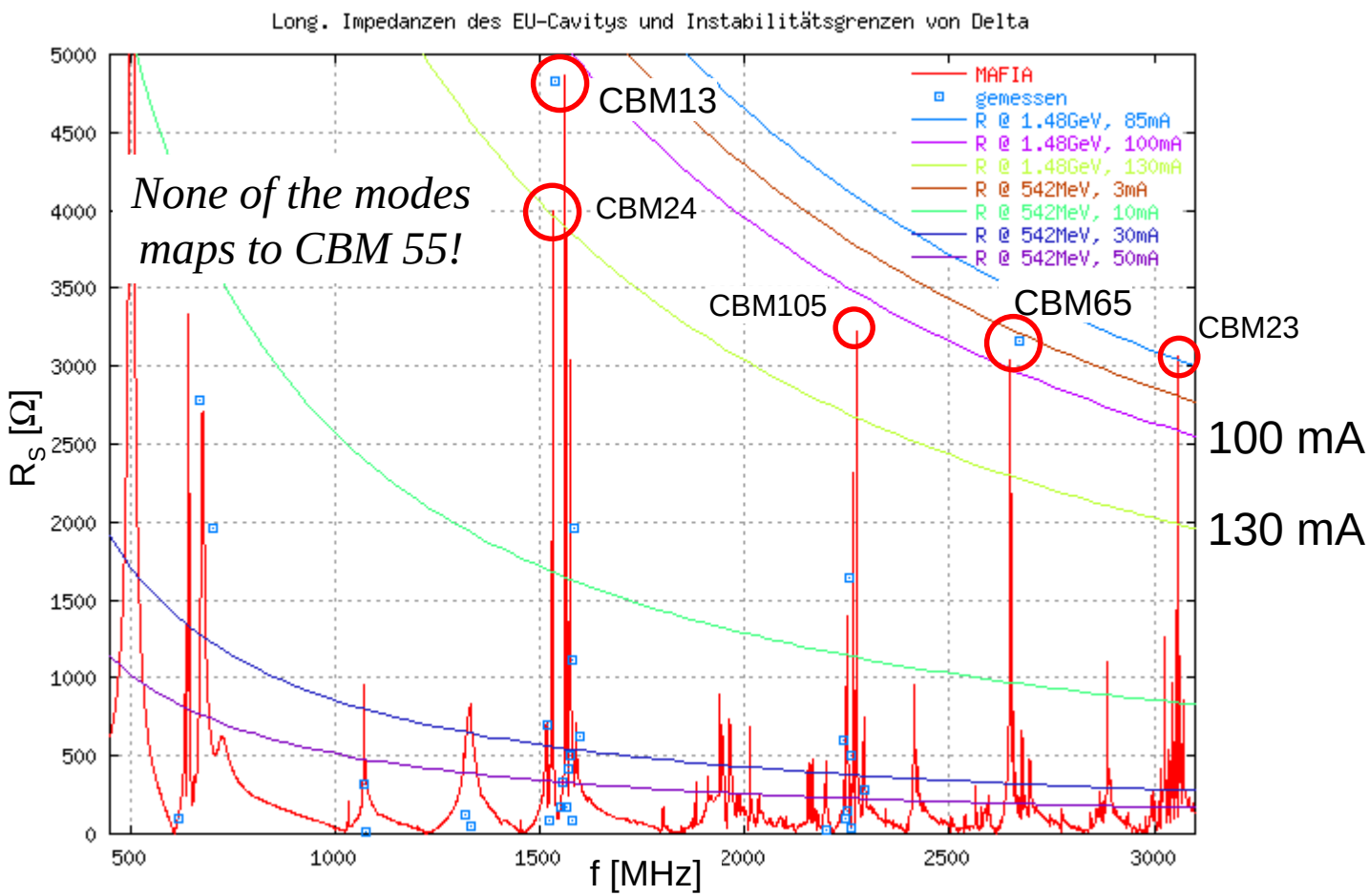
27.& 28.Jul. 04
(user week)

First Measurements With The EU-Cavity, again

CBM 21/22, this mode wasn‘t seen before!



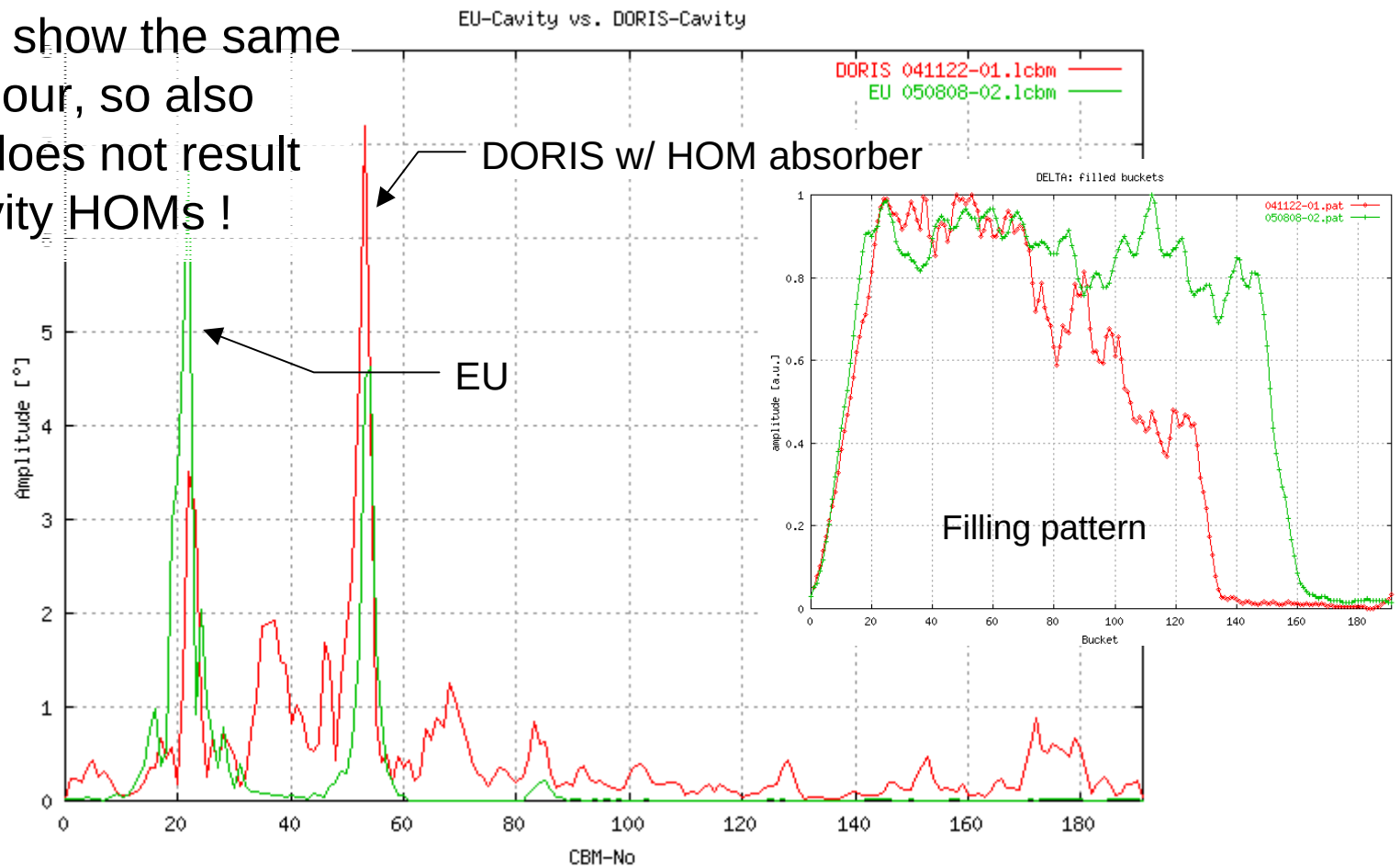
Impedance Thresholds Of The HOM-damped Cavity In DELTA



MAFIA simulation and mode measurement: F. Marhauser

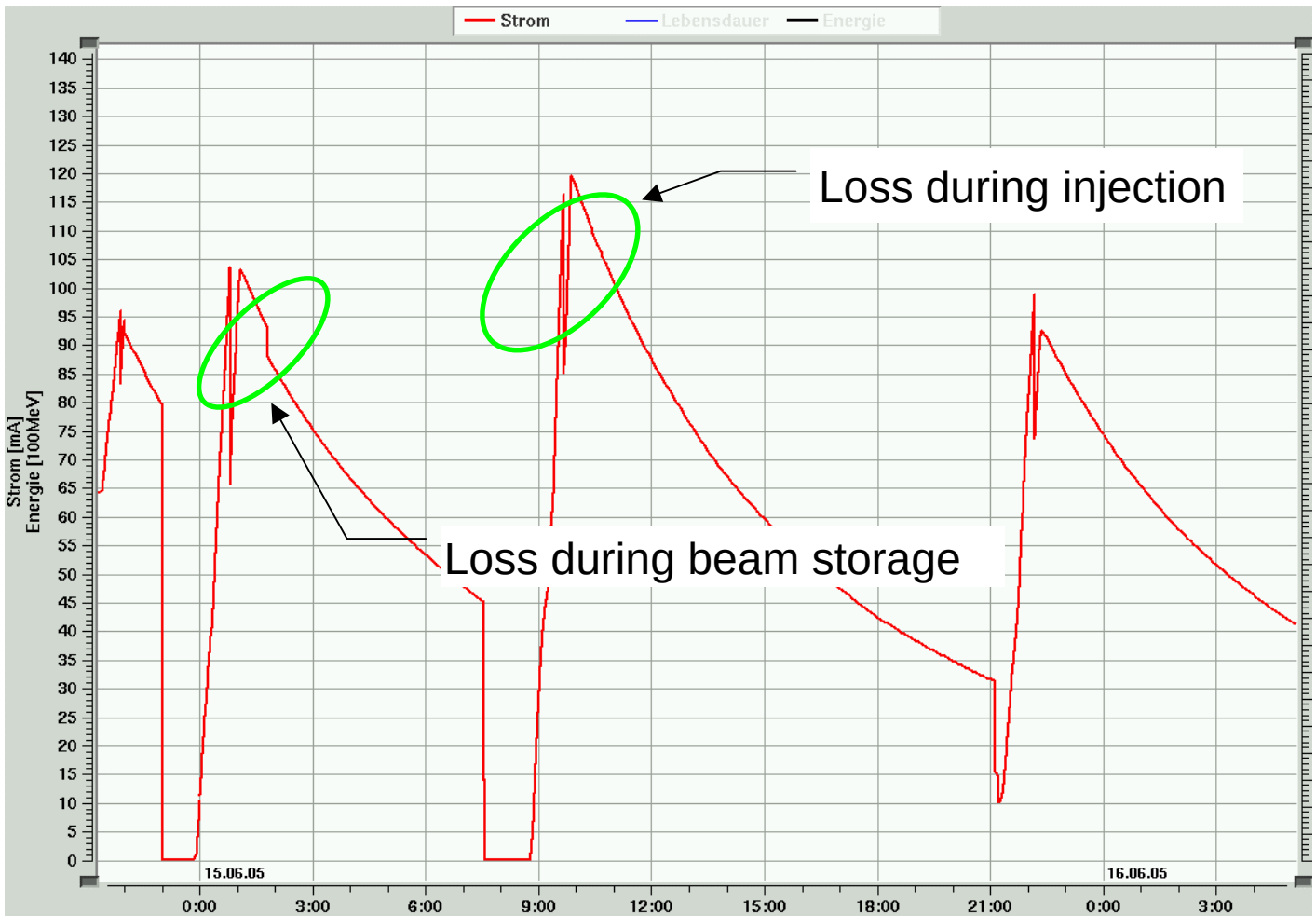
CBM Spectra Of DORIS- And EU-Cavity

Both cavities show the same mode behaviour, so also CBM 21/22 does not result from EU-Cavity HOMs !



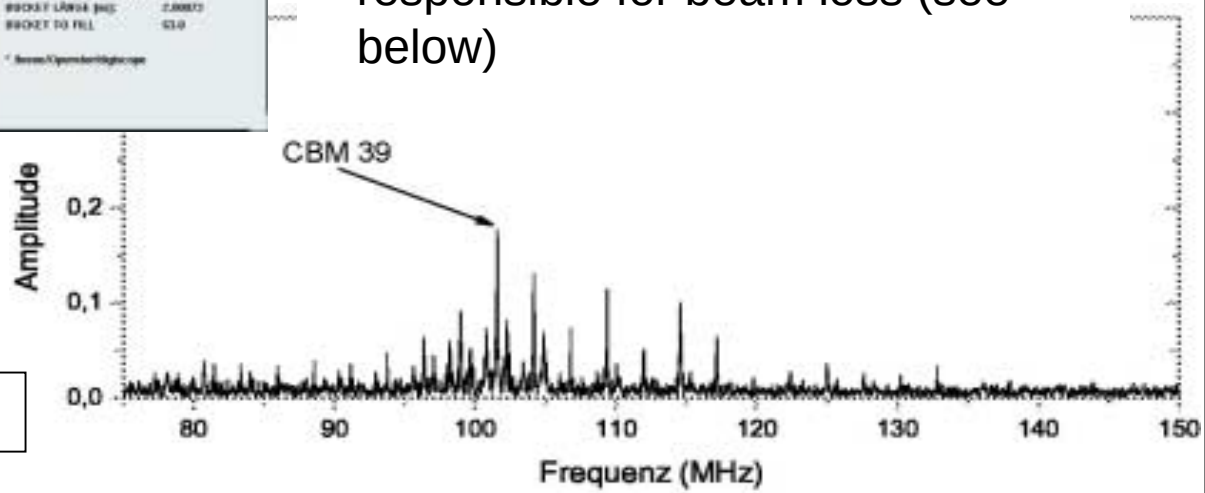
„If the CBM-spectra with both resonators are the same, are there any benefits from the new cavity?“

Typical User-Dedicaded Week With The DORIS Cavity



Post Mortem Analysis Of Beam Losses

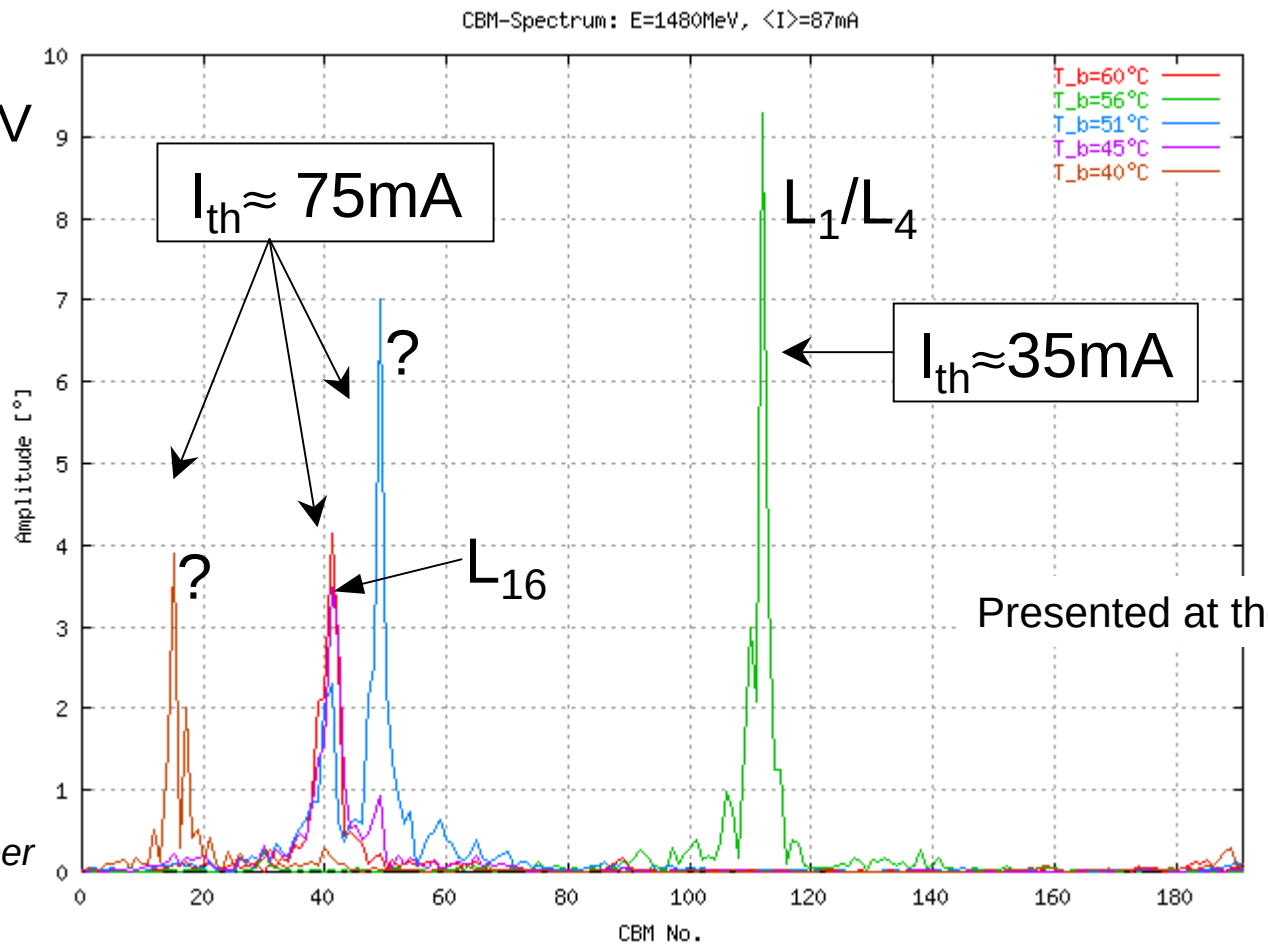
- For filling structure analysis an oscillograph PCI Card samples the time signal of the beam.
- CBM losses produce a certain filling structure (see left figure)
- FFT of this signal contains information on the CBM that was responsible for beam loss (see below)



J.Kettler: master thesis, June 05

CBM Spectra From The Characterisation Measurements

E= 1480MeV



T_b= 40-60°C

I= 87mA

Presented at the 2003 meeting

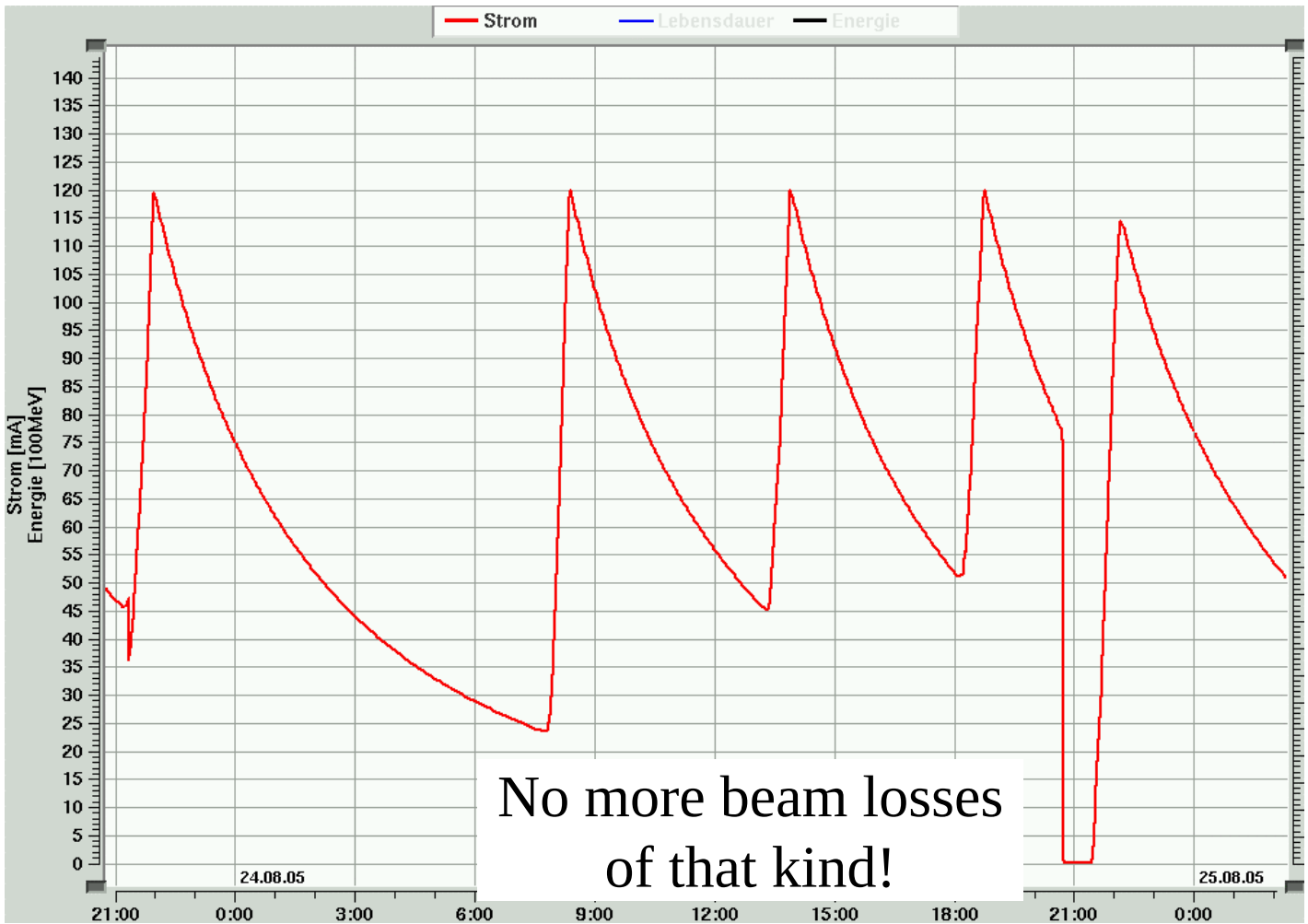
DORIS-cavity

w/o HOM-absorber

red: 60°C

brown: 40°C

A User-Dedicaded Week With The HOM-Damped Cavity



No more beam losses of that kind!

Summary

- Successful test with beam @ 1.5 GeV up to 140mA
- Still no cavity induced collective mode found
- Even better development of vacuum pressure than last time
- Low energy @ 550 MeV test still pending