

Operation of the n.c. EU-HOM- Damped Cavity with Beam at DELTA

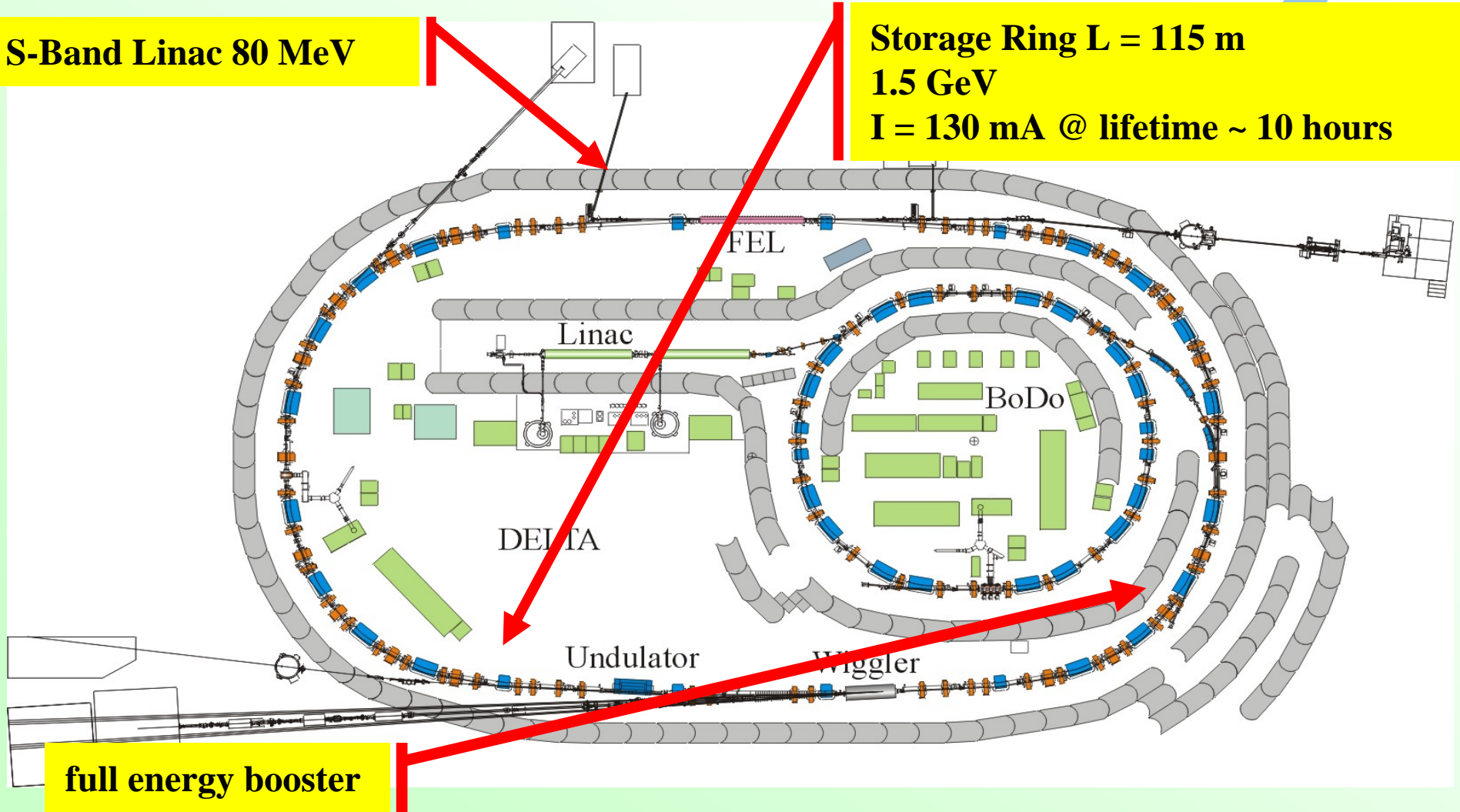
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DELTA group

contribution to WG 1 @ FLS2006



S-Band Linac 80 MeV

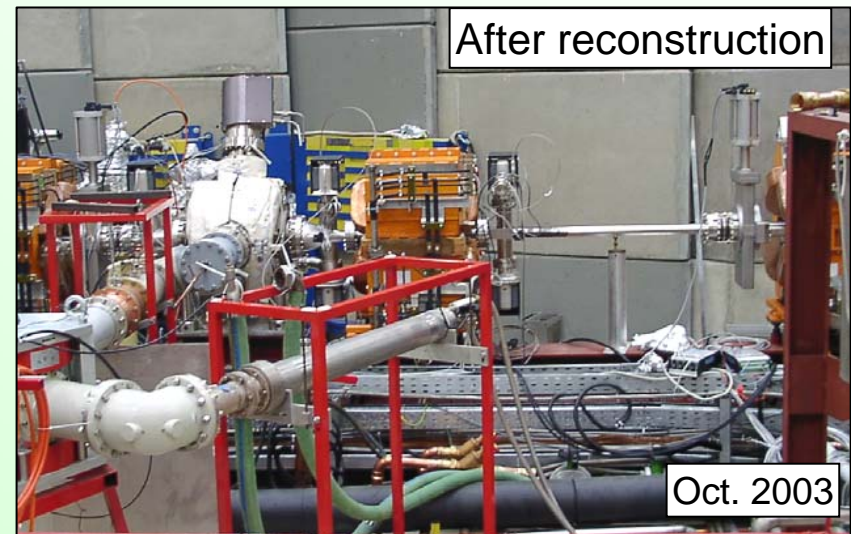
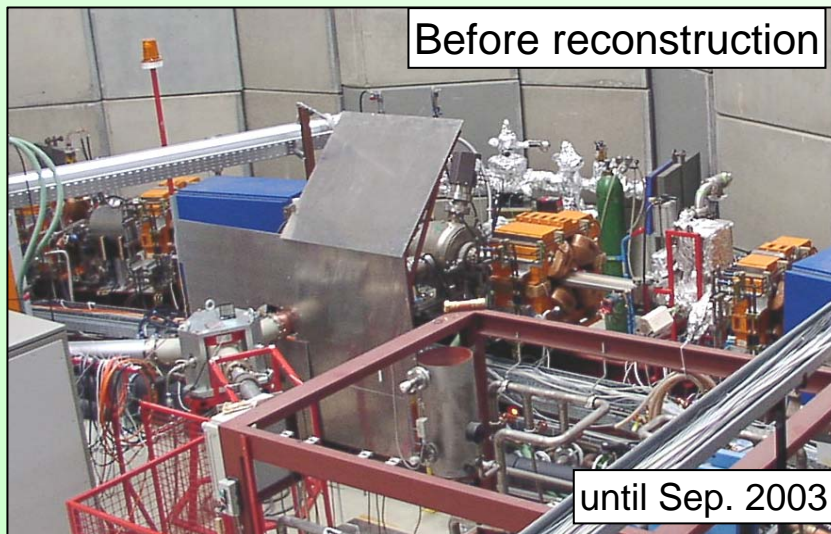
**Storage Ring L = 115 m
1.5 GeV
I = 130 mA @ lifetime ~ 10 hours**



full energy booster



RF-Section with DORIS-Cavity





HOM-damped Cavity Installed

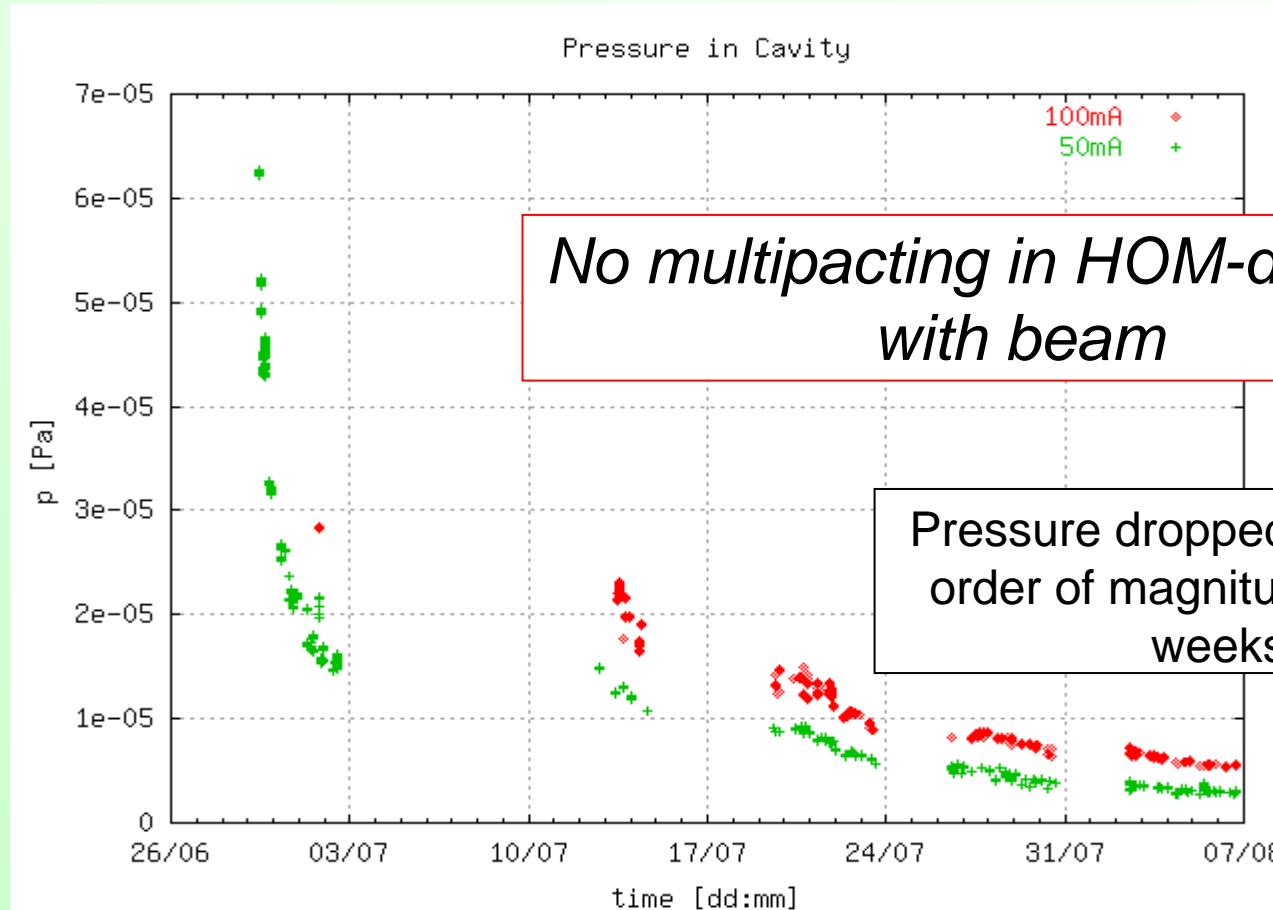
1. period 5/2004 - 9/2004



- The cavity was preconditioned up to 30 kW (thermal load, CW) at BESSY and delivered to DELTA (17.May `04).
- Reconditioning within one day (0-30 kW, 5% duty cycle) (02.Jun. `04)
- 28 kW CW were reached the next day.
- 28.Jun. `04: First beam stored with EU-cavity up to 25 mA
- 29.Jun. `04: Vacuum limited 60 mA stored
- 30.Jun. `04: 100 mA stored.
- 14.Jul. `04: 130 mA stored. (I_{\max} of DELTA)
- Sep. 2004 taken out due to leakage in one HOM-damper

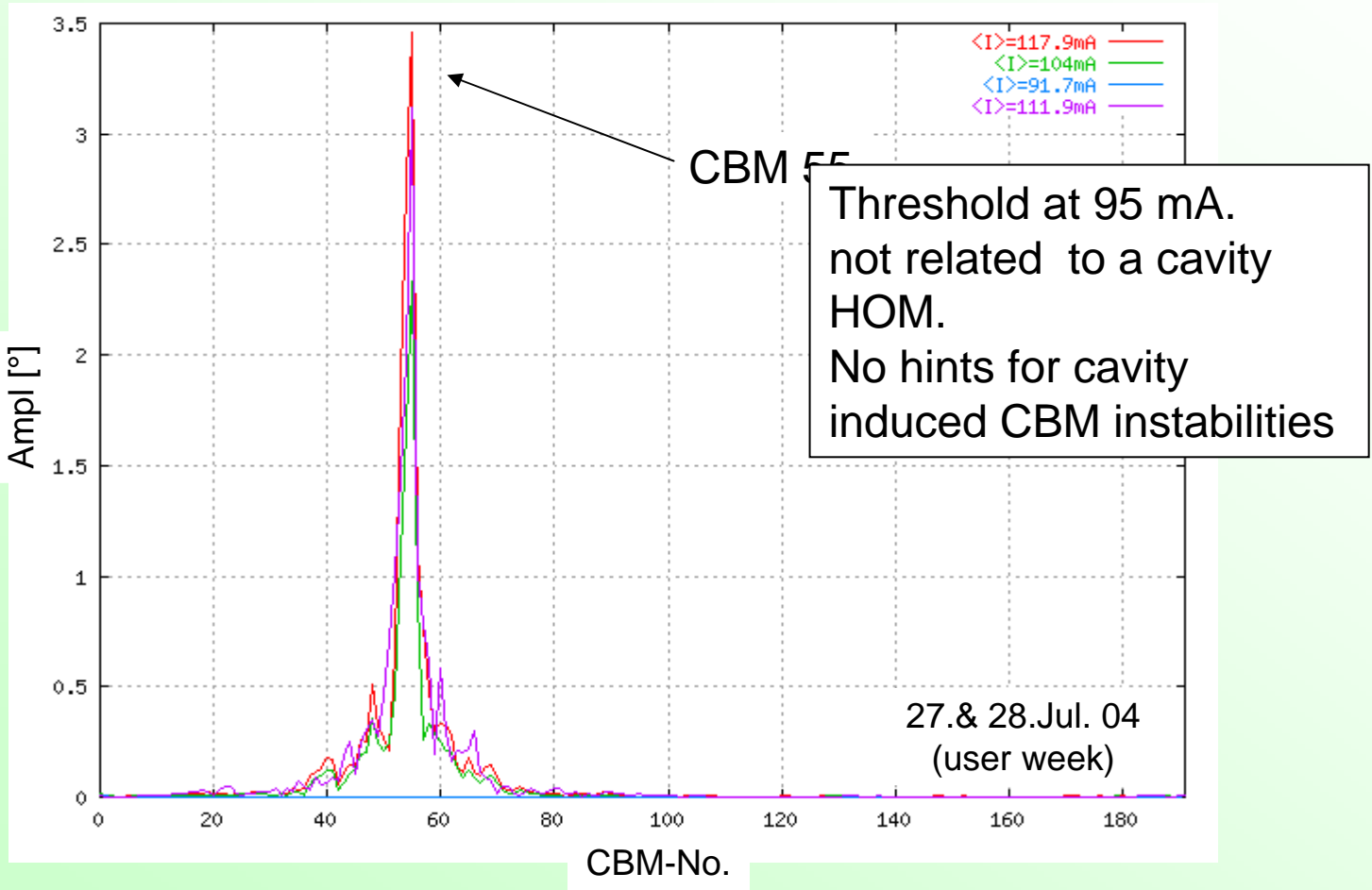


Pressure Evolution During Operation





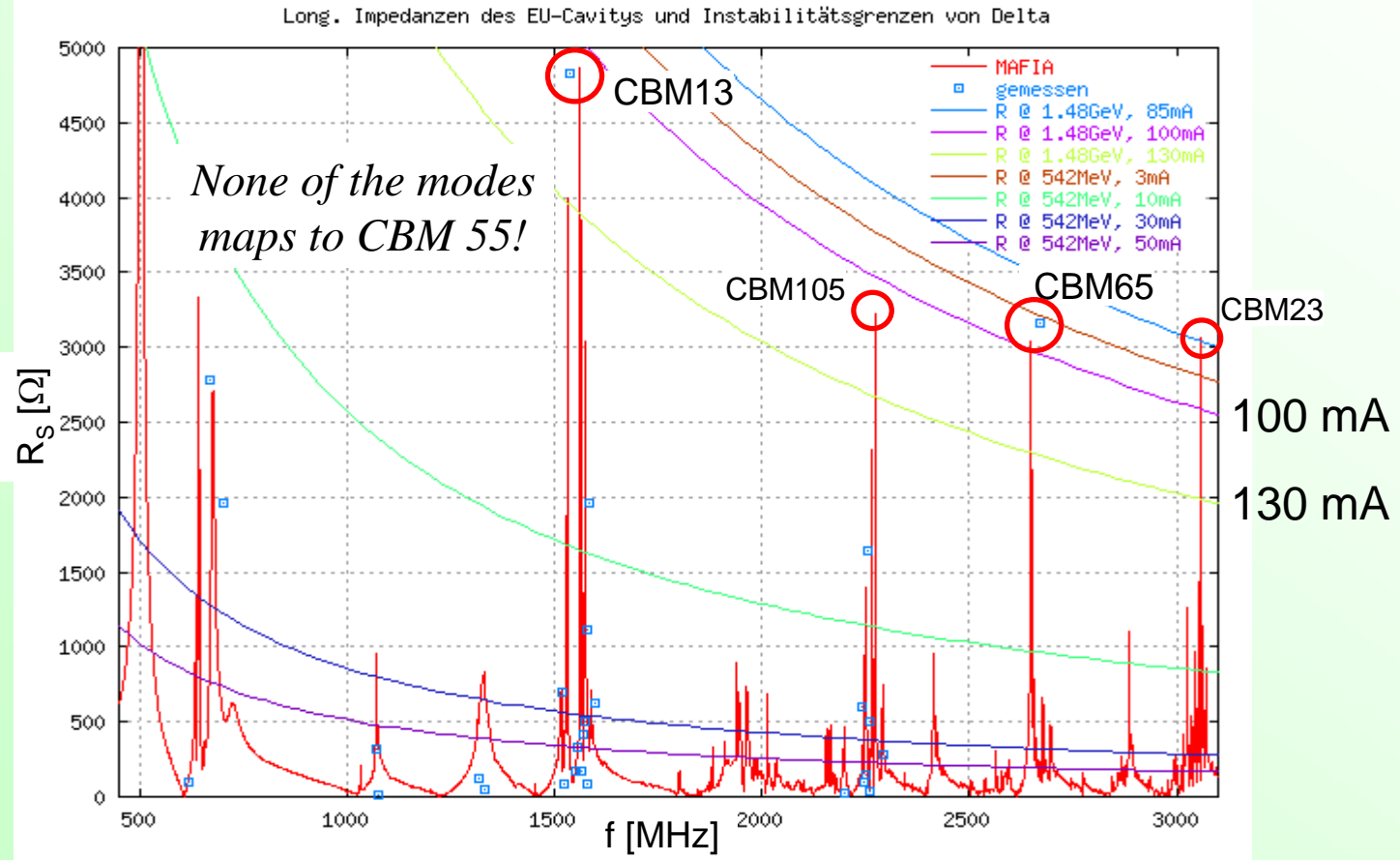
Characterisation at 1.5 GeV





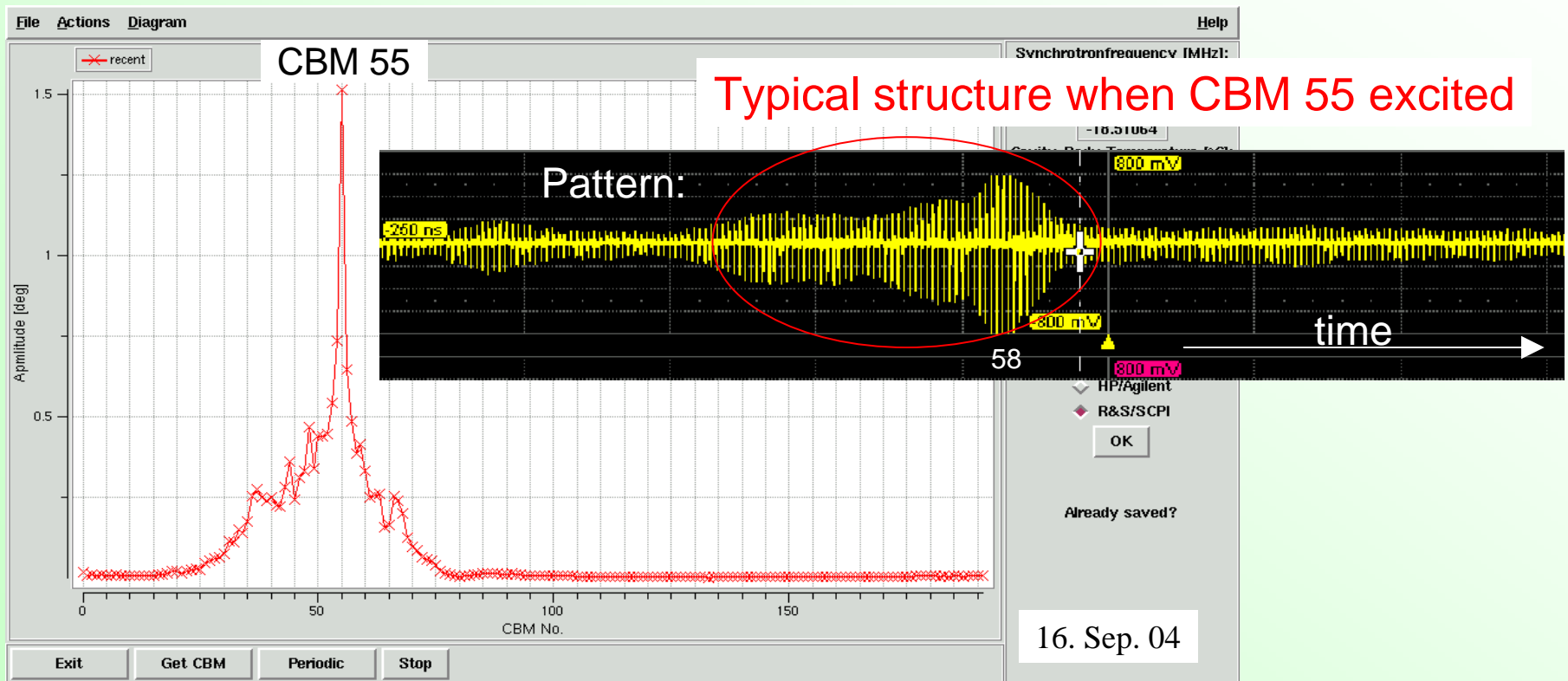
Impedance Thresholds of the HOM-damped Cavity in DELTA

MAFIA simulation and mode measurement: F. Marhauser et al. BESSY





CBM-Measurements with DORIS-Cavity



Same CBM excited as with EU-Cavity \Rightarrow Pattern induced!

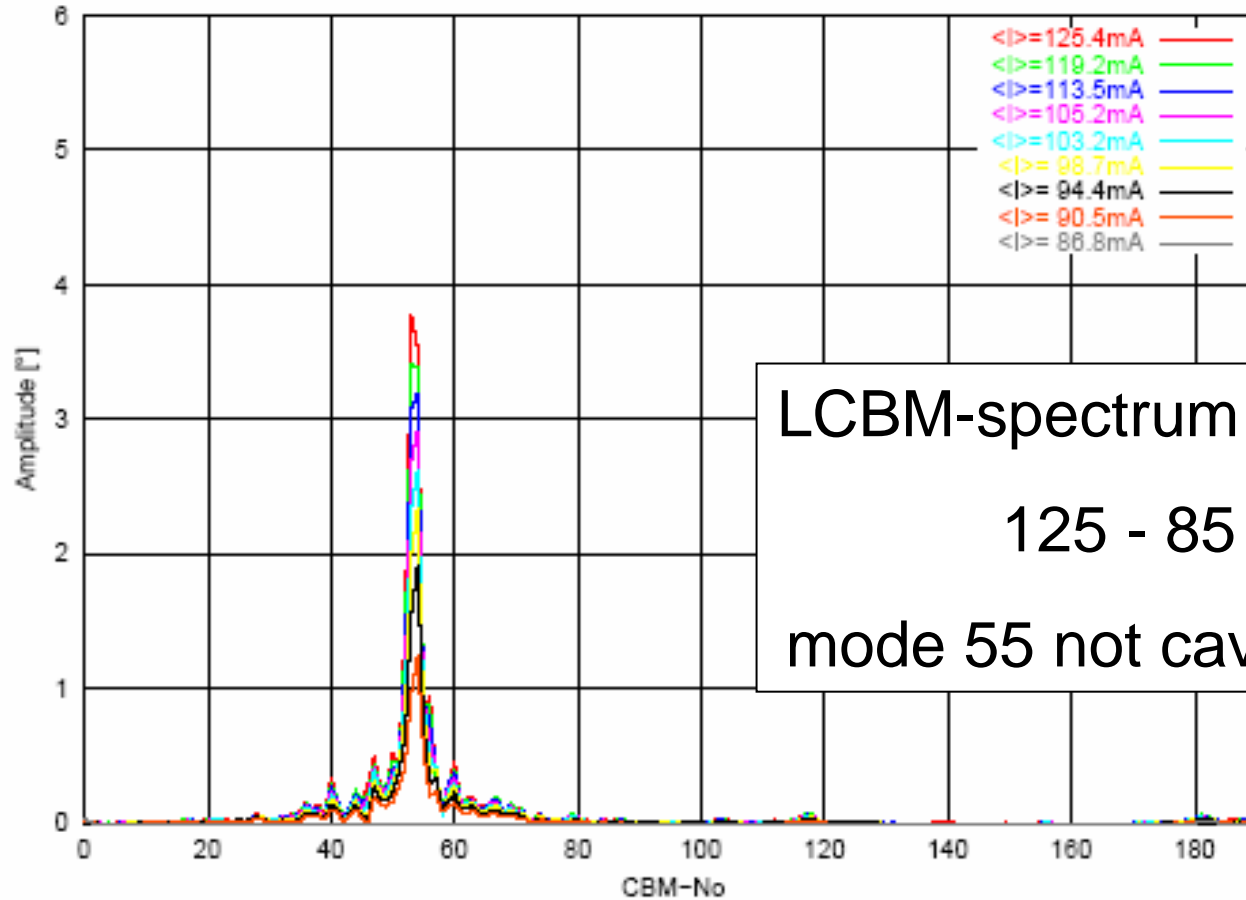


HOM-damped Cavity Installed

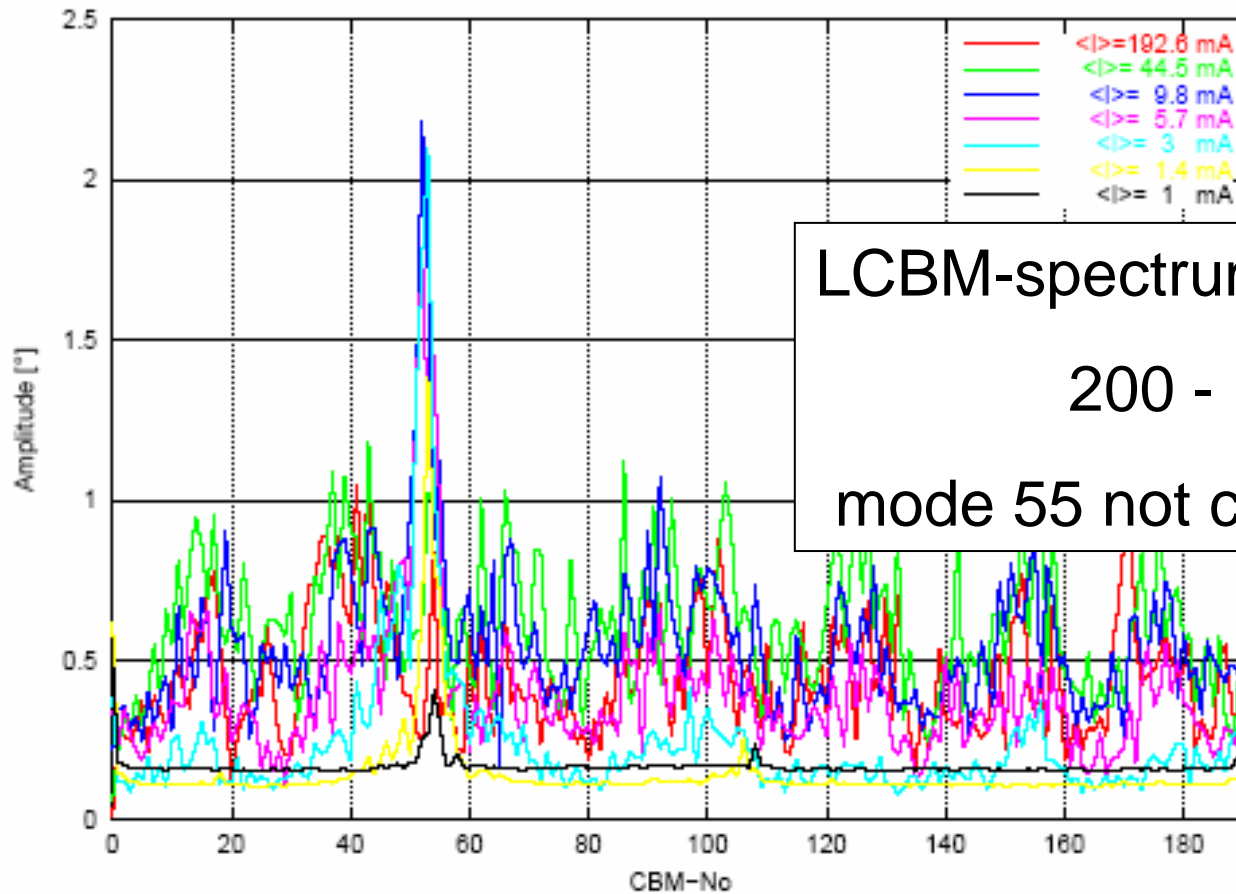
2. period 5/2005 - today



- standard operation as single DELTA cavity
- beam characterisation @ 1.5 and 0.542 GeV
- look to cavity impedance via HOM-damper signal
- no hints for CBM-instabilities caused by the cavity
- LCBM at mode 55 detected with threshold currents ~ 90 mA (1.5 GeV) down to 1 mA (542 MeV). Reason for instability not found yet. Instability may hide other instabilities caused by cavity (impedance < 50 k Ω). But no hints for that up to now.



LCBM-spectrum @ 1.5 GeV
 125 - 85 mA
 mode 55 not cavity induced

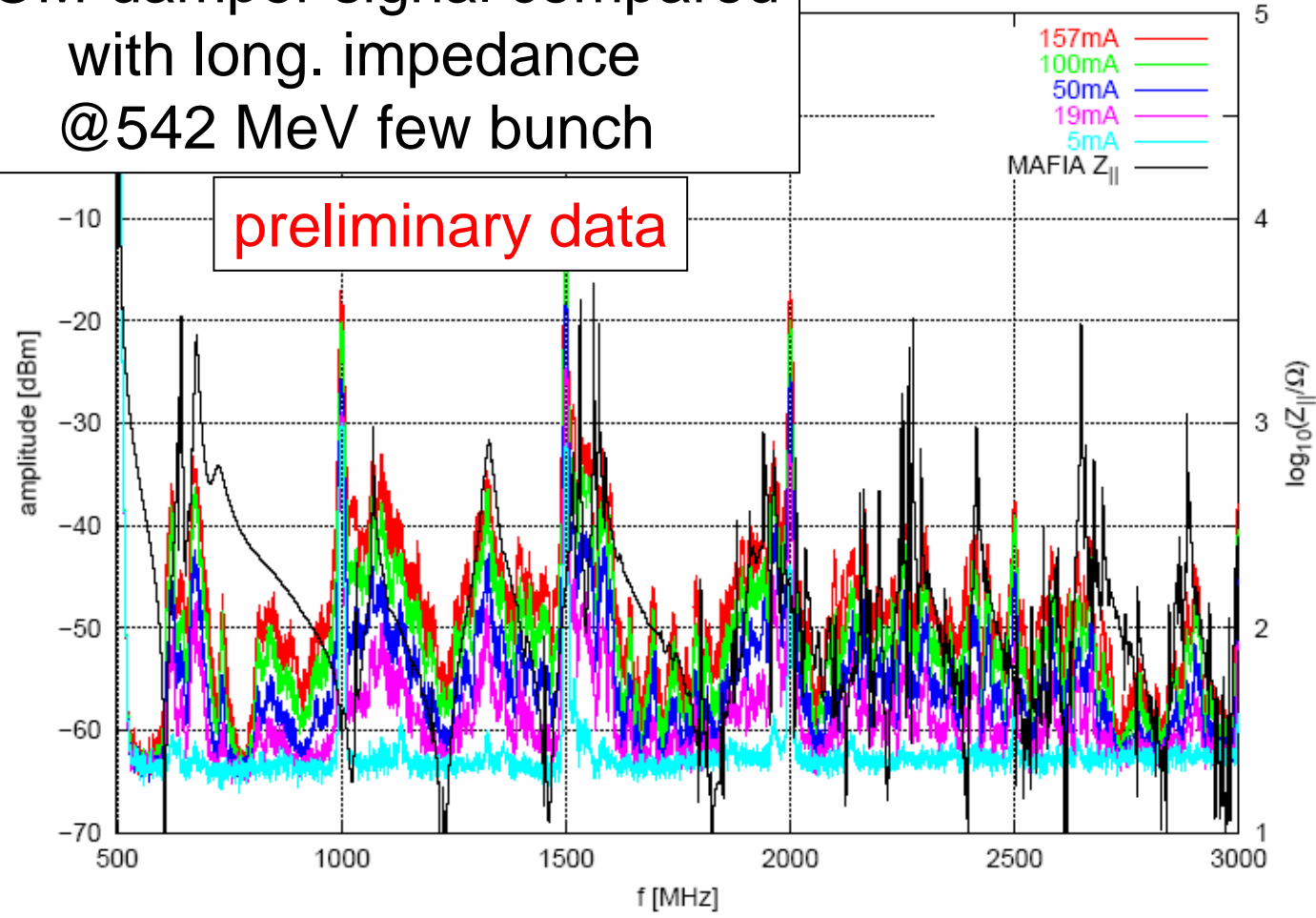


LCBM-spectrum @ 542 MeV
 200 - 1 mA
 mode 55 not cavity induced



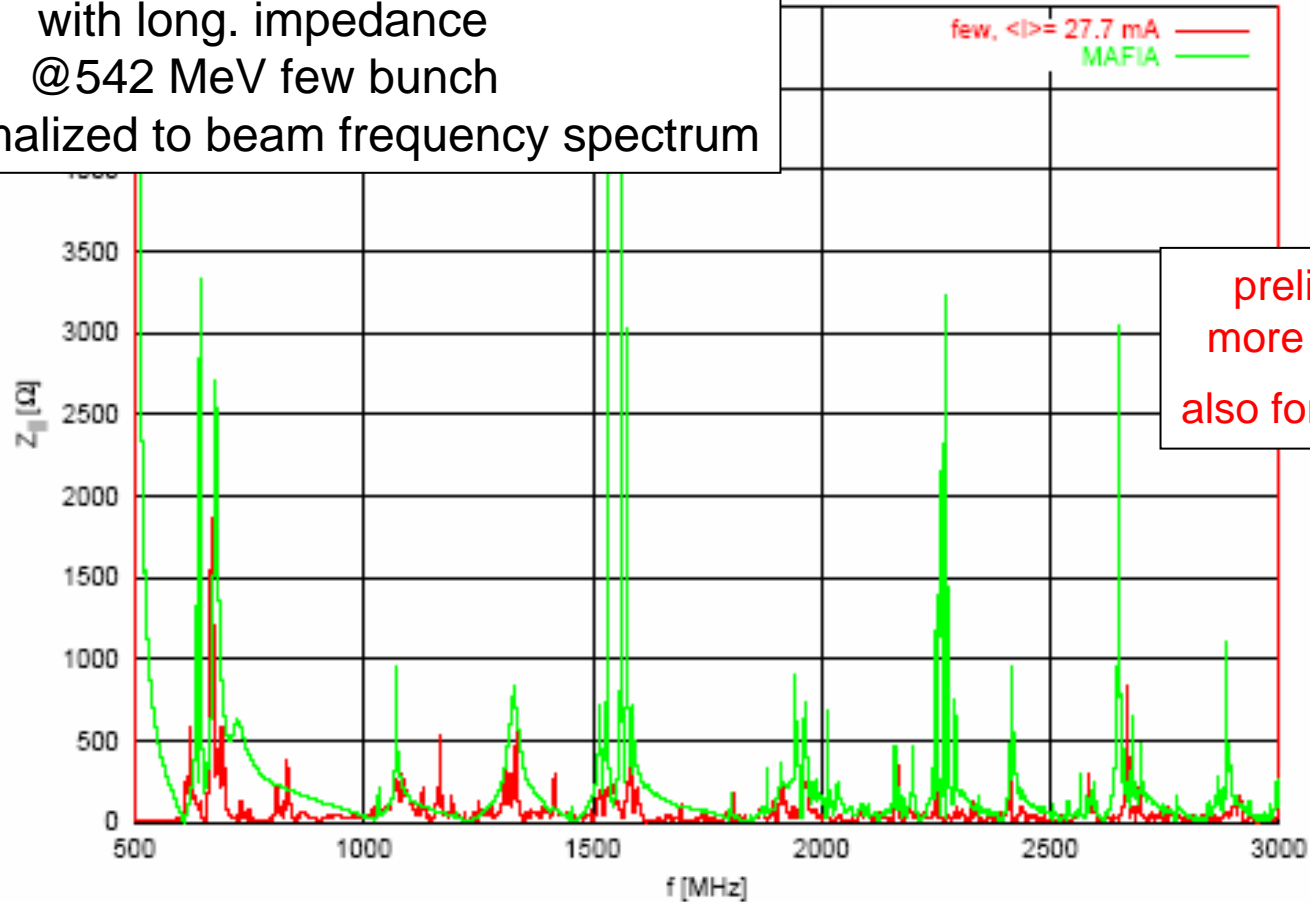
HOM-damper signal compared with long. impedance @542 MeV few bunch

preliminary data





HOM-damper signal compared
with long. impedance
@542 MeV few bunch
signal normalized to beam frequency spectrum



preliminary data
more data to come
also for single bunch