Update on the MQTL

- New results from magnetic tests and measurements
- Optics considerations
- Digression: other lattice correctors
- Outlook

New results from magnetic tests and measurements - I

- **Magnetic tests:**
  - Many more apertures measured (quench performance).
  - Many more data for single apertures with modified mechanical structure (Cu instead of G11).
  - Results of magnetic tests seem to confirm that the new structure is more stable and features a better performance.
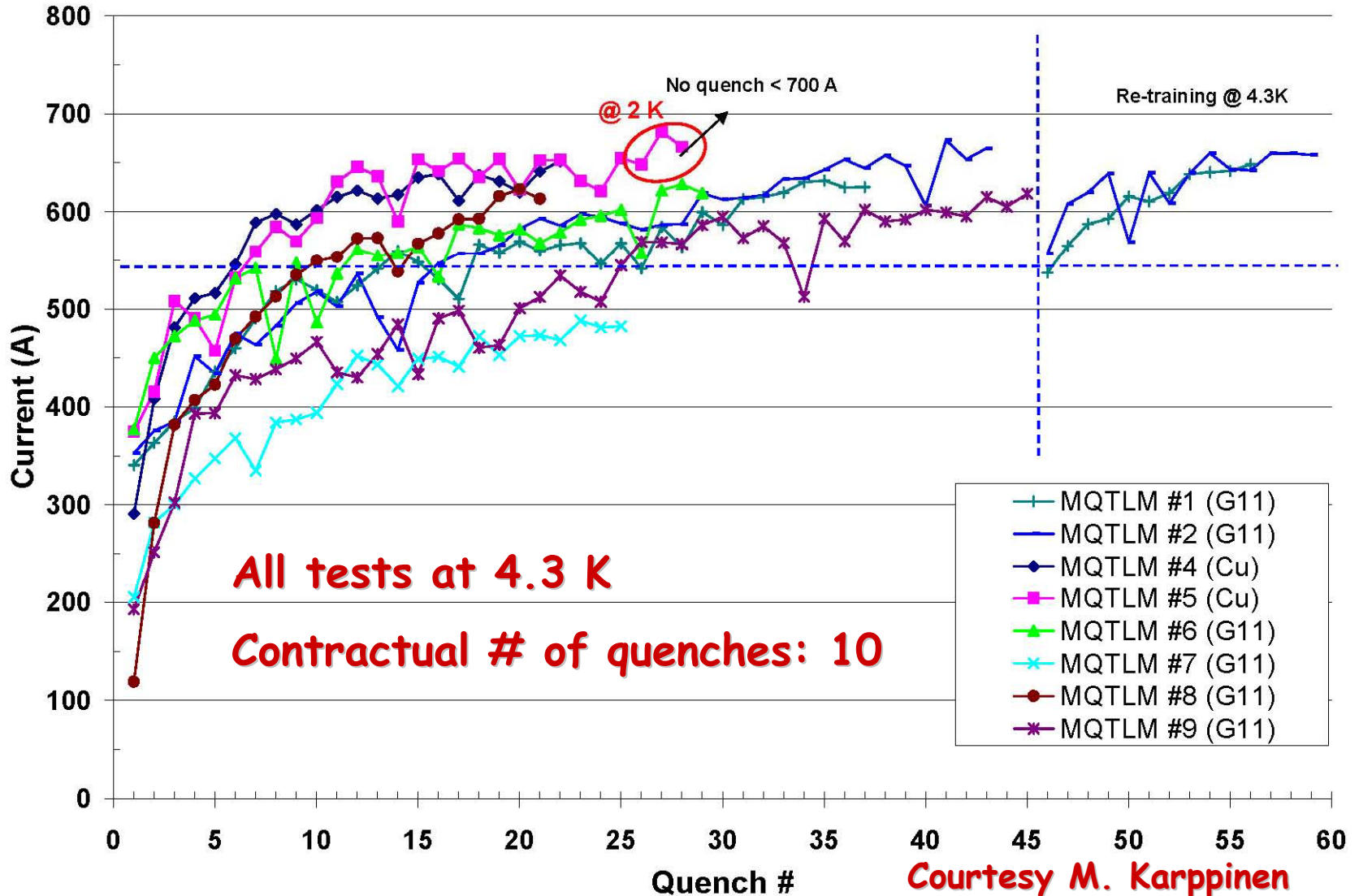- **Magnetic measurements (in Block 4, i.e. local field quality):**
  - First assembly, i.e. twin-aperture ready and measured.
  - Field quality measured, even with asymmetric powering of the two apertures.
  - Analysis still in progress: preliminary results indicate that the effect of cross-talks is "small"…but there are still some mysteries!

First Measurement results for single apertures - I

MQTLM Training

See LOC 26/04/05

No quench < 700 A

@ 2 K

Re-training @ 4.3K

All tests at 4.3 K

Contractual # of quenches: 10

Current (A)

Quench #

- MQTLM #1 (G11)
- MQTLM #2 (G11)
- MQTLM #4 (Cu)
- MQTLM #5 (Cu)
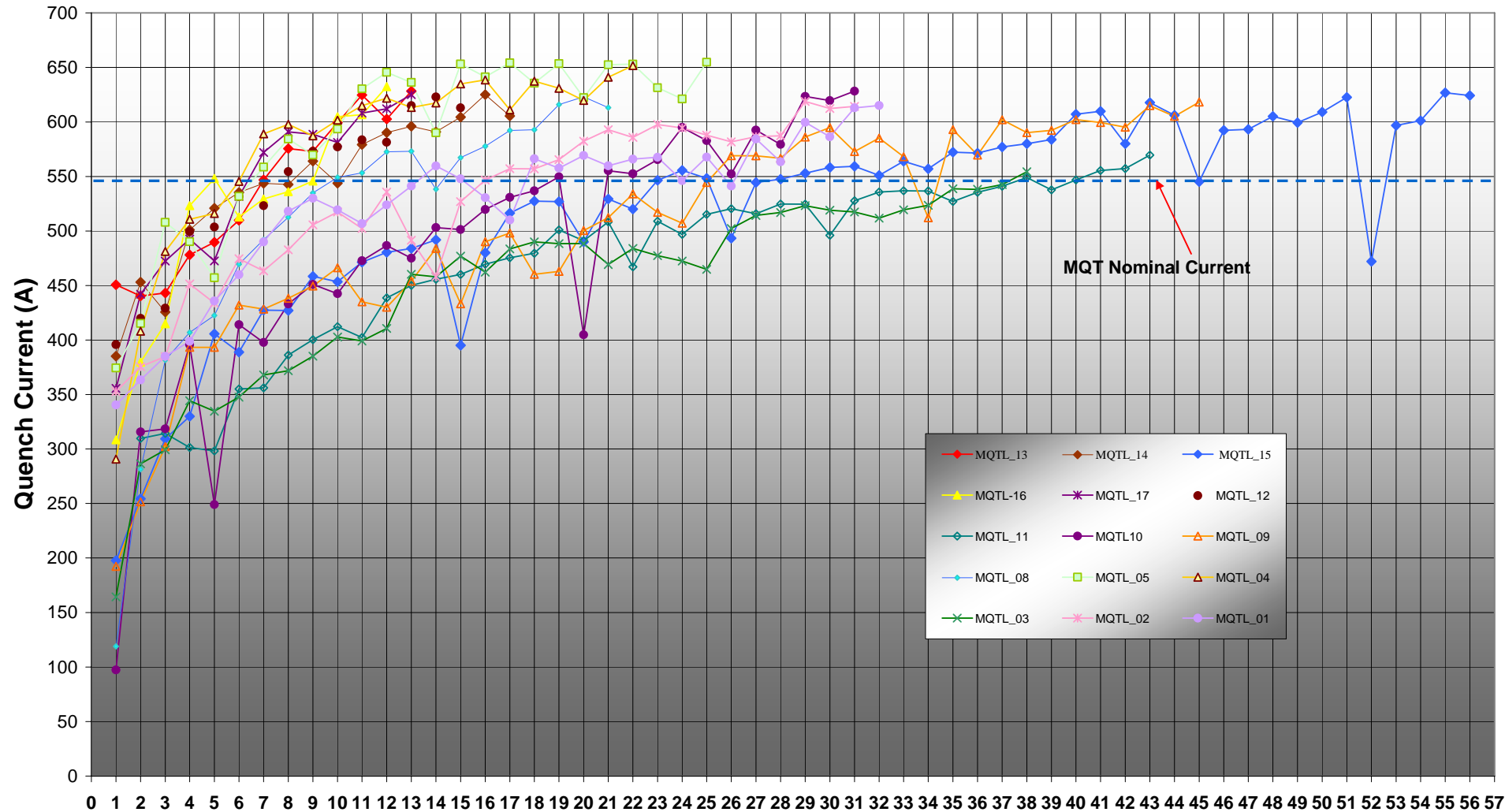- MQTLM #6 (G11)
- MQTLM #7 (G11)
- MQTLM #8 (G11)
- MQTLM #9 (G11)

Courtesy M. Karppinen

New results from magnetic tests and measurements - II

Training Quenches @ 4.3K

Courtesy W. Venturini Delsolaro

Optics considerations - I

- **Proposed strategy from AT (already presented at LOC 26/04/05):**
  - Training:
    - To change the central post material. The positive impact on performance should be confirmed by measurements.
    - To install "weak" elements produced so far in "safe" locations, i.e. determined in terms of required strength and flexibility for the LHC optics
    - "Safe" locations should be defined by ABP.
- **New facts:**
  - The optical configurations taken into account are:
    - Injection
    - Low-beta (including variation of MQTL during squeeze)
    - IR3 detuned
    - IR4 tuning (with guess estimates for beam 2 settings)
    - TOTEM optics
    - Resonance free lattices

Optics considerations – II

IR3	Reserve (%)	IR7	Reserve (%)	Others	Reserve (%)
MQTLI.11L3	12.5	MQTLI.11L7	75.4	MQTLI.11R1	-17.5
MQTLI.10L3	-1.5	MQTLI.10L7	2.1	MQTLI.11L2	-14.9
MQTLI.B9L3	-1.5	MQTLI.B9L7	13.2	MQTLI.11R2	-1.5
MQTLI.A9L3	3.2	MQTLI.A9L7	13.2	MQTLI.11L4	46.3
MQTLI.8L3	-1.5	MQTLI.8L7	60.1	MQTLI.11R4	80.5
MQTLI.7L3	2.2	MQTLI.7L7	-10.0	MQTLI.11L5	-11.7
MQTLH.F6L3	30.2	MQTLH.F6L7	14.3	MQTLI.11R5	-17.5
MQTLH.E6L3	30.2	MQTLH.E6L7	14.3	MQTLI.11L6	73.4
MQTLH.D6L3	30.2	MQTLH.D6L7	14.3	MQTLI.11R6	69.0
MQTLH.C6L3	30.2	MQTLH.C6L7	14.3	MQTLI.11L8	39.4
MQTLH.B6L3	30.2	MQTLH.B6L7	14.3	MQTLI.11R8	-11.7
MQTLH.A6L3	30.2	MQTLH.A6L7	14.3	MQTLI.11L1	-11.7
MQTLH.A6R3	29.7	MQTLH.A6R7	11.9		
MQTLH.B6R3	29.7	MQTLH.B6R7	11.9	**Nominal current 400 A**	
MQTLH.C6R3	29.7	MQTLH.C6R7	11.9	**for both MQTLH and MQTLI**	
MQTLH.D6R3	29.7	MQTLH.D6R7	11.9		
MQTLH.E6R3	29.7	MQTLH.E6R7	11.9		
MQTLH.F6R3	29.7	MQTLH.F6R7	11.9		
MQTLI.7R3	-25.5	MQTLI.7R7	72.9		
MQTLI.8R3	37.1	MQTLI.8R7	16.4		
MQTLI.A9R3	9.5	MQTLI.A9R7	56.5		
MQTLI.B9R3	9.5	MQTLI.B9R7	56.5		
MQTLI.10R3	30.3	MQTLI.10R7	-5.3		
MQTLI.11R3	-2.9	MQTLI.11R7	75.3		

Digression: other lattice correctors

- A similar request was already issued, i.e. where to locate "weak" MQTs.
- Following the discussion for MQTLs it turned out that no action was taken in order to ensure that in the appropriate SSS is installed the corrector matching the strength of the slot foreseen.
- Improvements for the future:
  - Better co-ordination at the level of AT Groups (MAS and MEL).
  - Co-ordination within the LOC magnet team to select SSS with the appropriate corrector.
  - Definition of a strategy to trace correctly the SSS composition at MEB.

Outlook

- **Questions raised by AT/MEL:**
  - Best location for MQTLI well-performing up to 400 A. Options
    - Q11R4 (80%), Q11L7 (75.4%), Q11R7 (75.3%).
  - Is it wise to accept a magnet well-performing only up to 300 A?
  - How to proceed with the others?
    - Re-training curves are available: they should be used to determine the maximum current.

- **MEB follow-up of the SSS composition and location.**

- **LTC presentation…**