Lawrence Berkeley National Laboratory

U.S. LARP

HQ/LHQ – quench protection status

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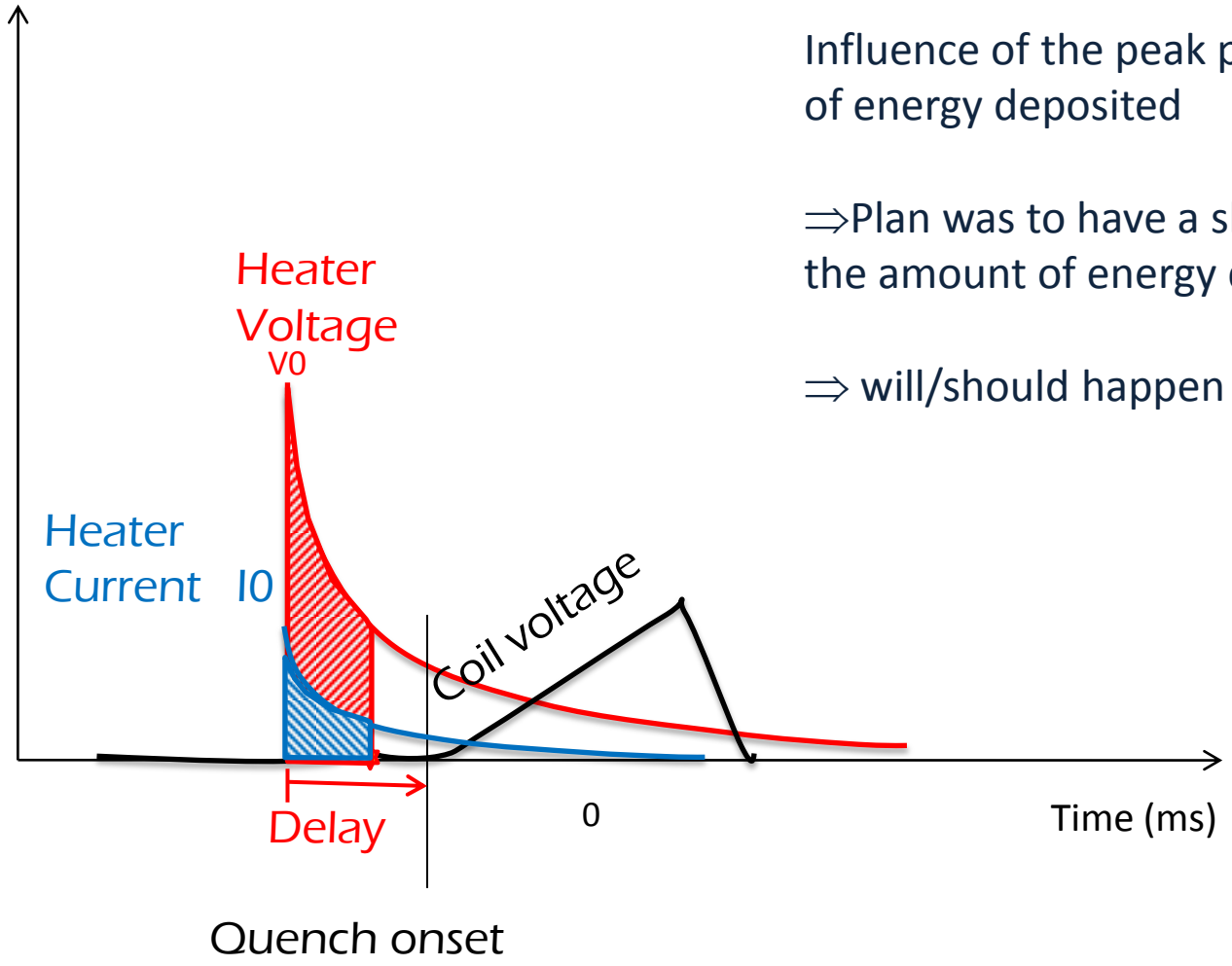
LARP Collaboration Meeting 16, Montauk NY – May 16th to 18th 2011

HQ01d – initial plan

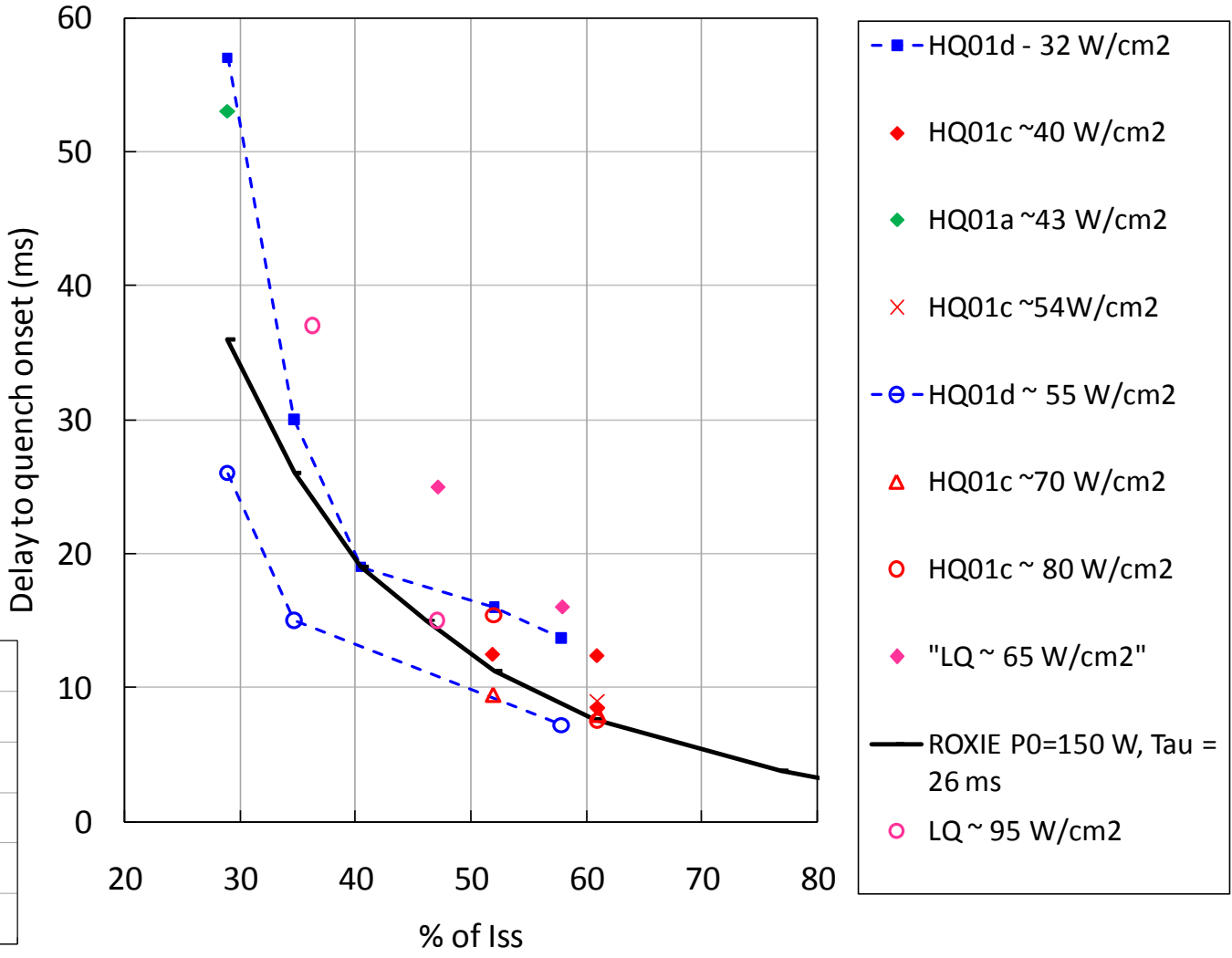


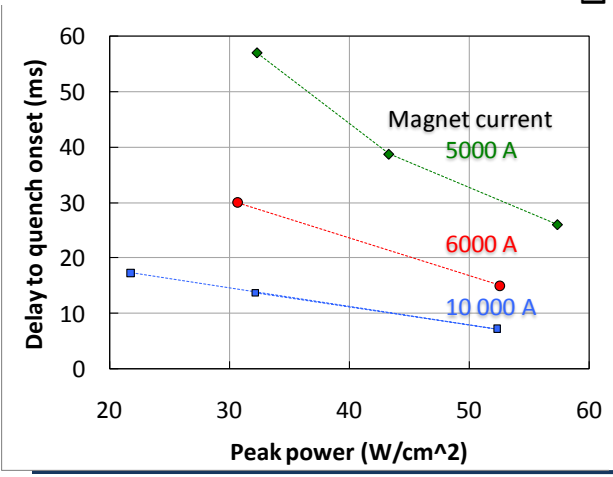
Influence of the peak power versus amount of energy deposited

⇒Plan was to have a short pulse to control the amount of energy deposited

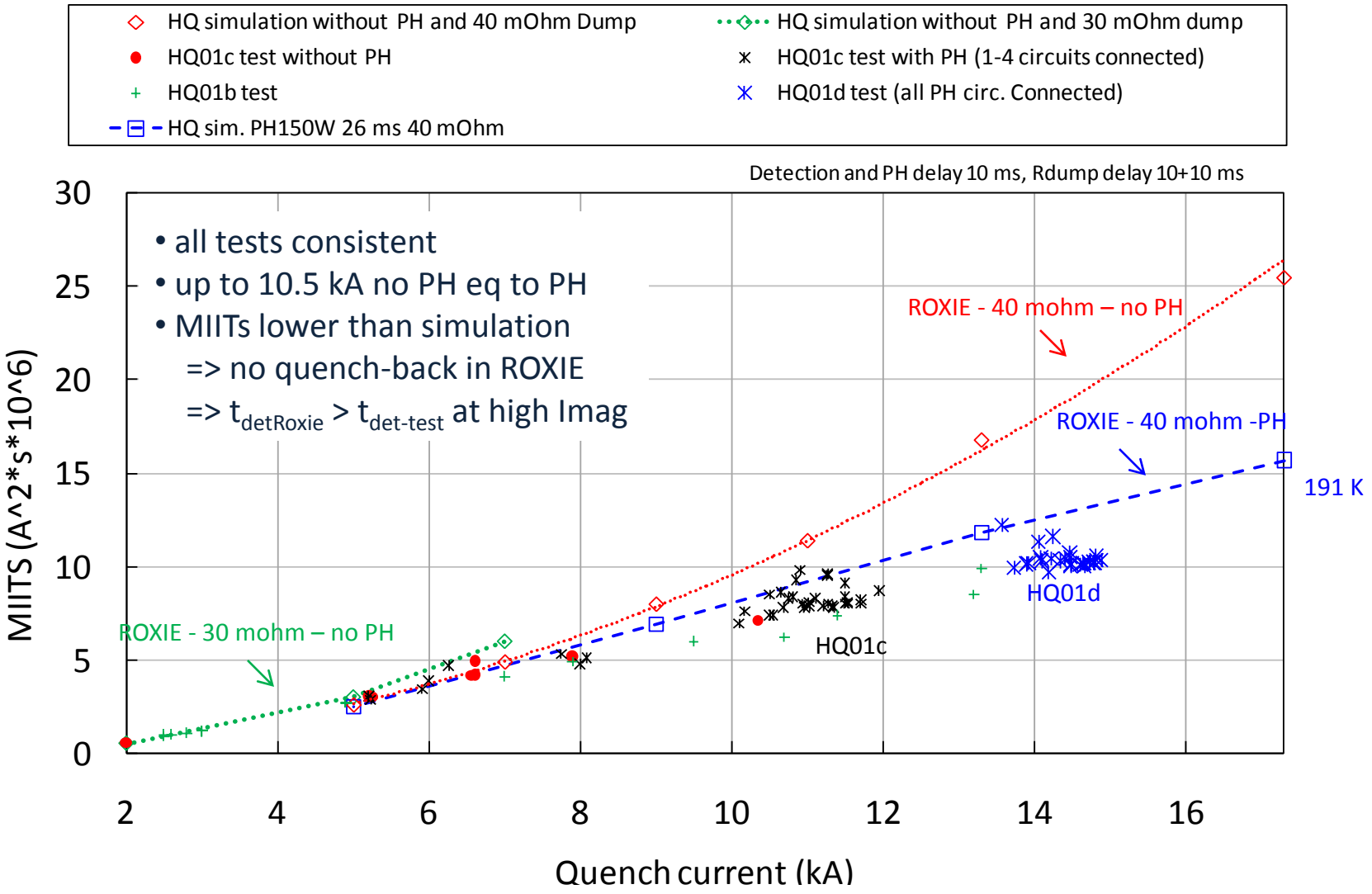
⇒ will/should happen in HQ01e

Delay time vs % of Iss

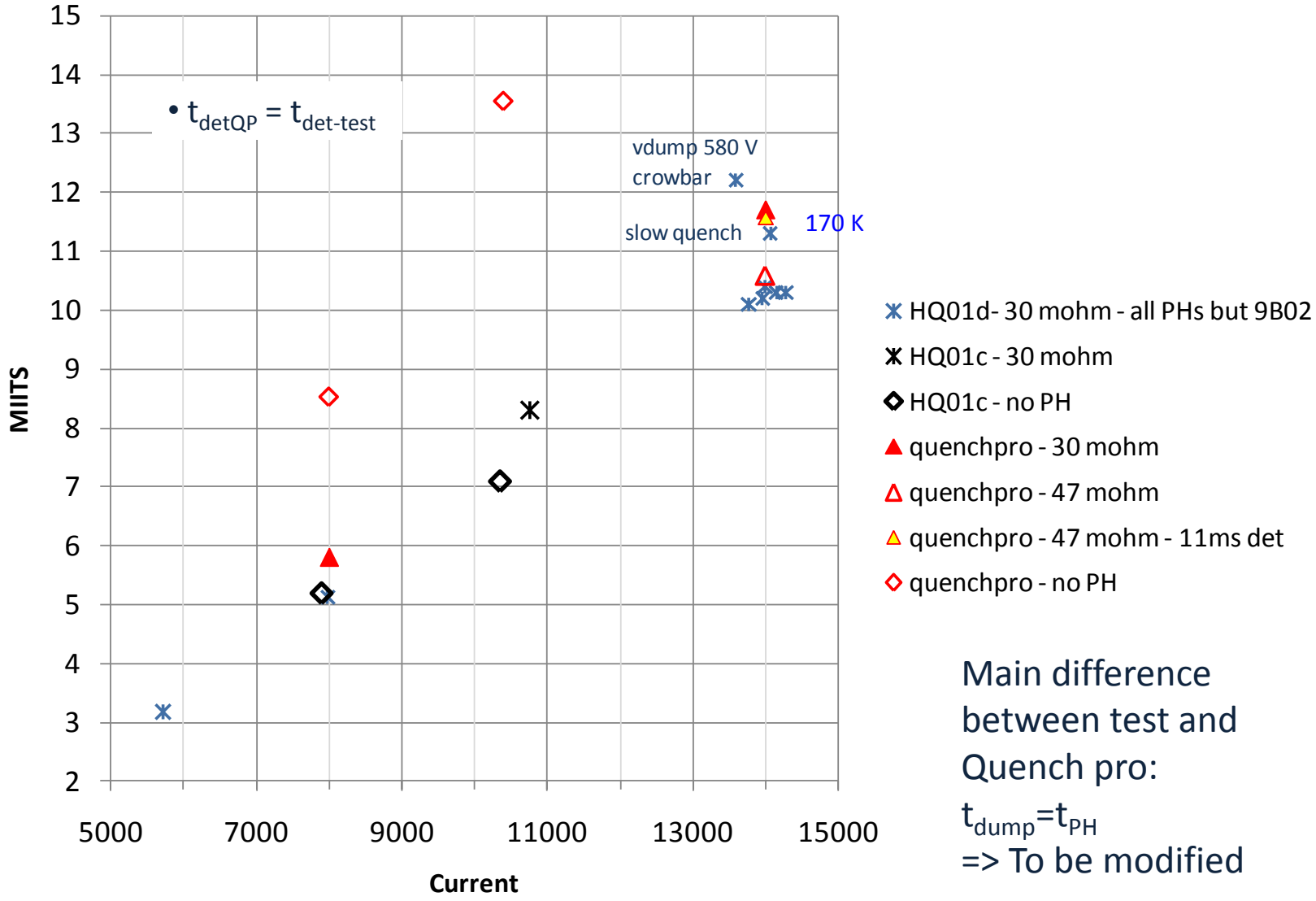




ROXIE: fine tuning based on HQ data



Quenchpro: fine tuning based on HQ data

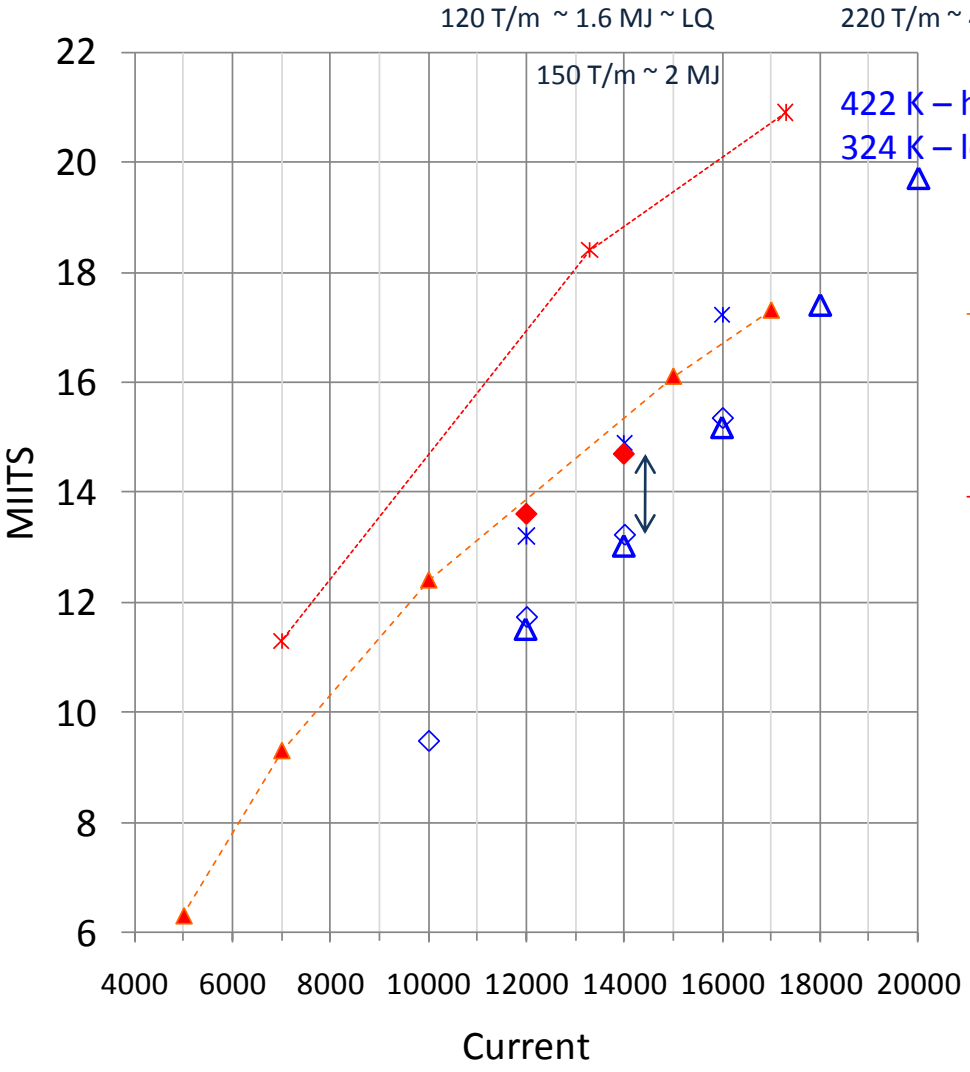


Main difference between test and Quench pro:

$t_{dump}=t_{PH}$

=> To be modified

Quenchpro / Roxie for LHQ



422 K – high field (14 T)
324 K – low field (6T)

LHQ-quenchpro - 40 mohm

LHQ - ROXIE - 40 mhm

~ 2.5 MIITs

LHQ-quenchpro-40 mohm-OLPH — $t_{dump}=t_{PH}$

LHQ - ROXIE - 40 mOhm - OLPH — $t_{dump}=t_{PH}$ + 10 ms

"LHQ - ROXIE - 30 mOhm - QP comparison"

LHQ - quenchpro - 30 mohm

$t_{dump}=t_{PH}$

Discrepancy coming from heater delay in Roxie and Quenchpro

- Without quench-back: full heater coverage required

Summary and next steps

- Need to quantify the quench-back effect to take it into account in LHQ
- Need to look at the voltages
- Need to estimate the change in heater delay due to the additional layer of Kapton => HQM01 (coil 12)
- More heater tests => HQ01d (energy – pulse) – LQS02
- temperature sensor ?