MBHDP201 test plan discussion

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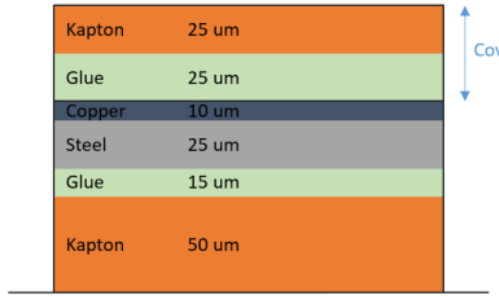
Magnet setup

This magnet is made of 2 apertures with external QH:

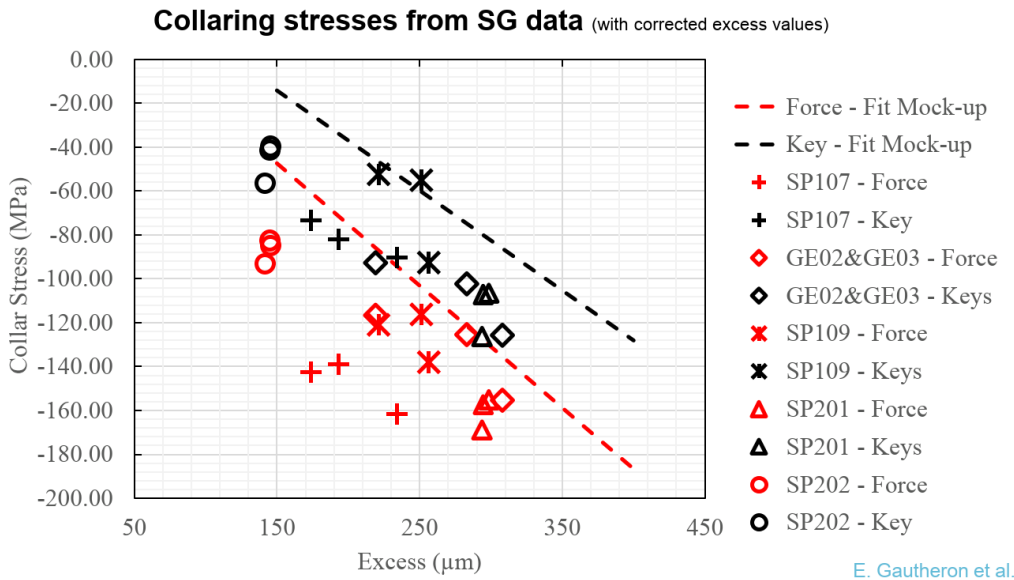
- Aperture 1 - **SP201**: coils **210** and **211** – target of 300 um
- Aperture 2 - **SP202**: coils **212** and **213** – target of 150 um (lower pre-stress)
- Nominal current: **11.85 kA**
- Ultimate current: **12.85 kA**



External QH for Models

Cable characteristic:

- Type: **PIT**
- RRR: **?**
- SS limit: **?**



E. Gautheron et al.

Technical detail about the shimming, collaring and stress: https://indico.cern.ch/event/869567/

Test setup

Test stand: **cluster D**

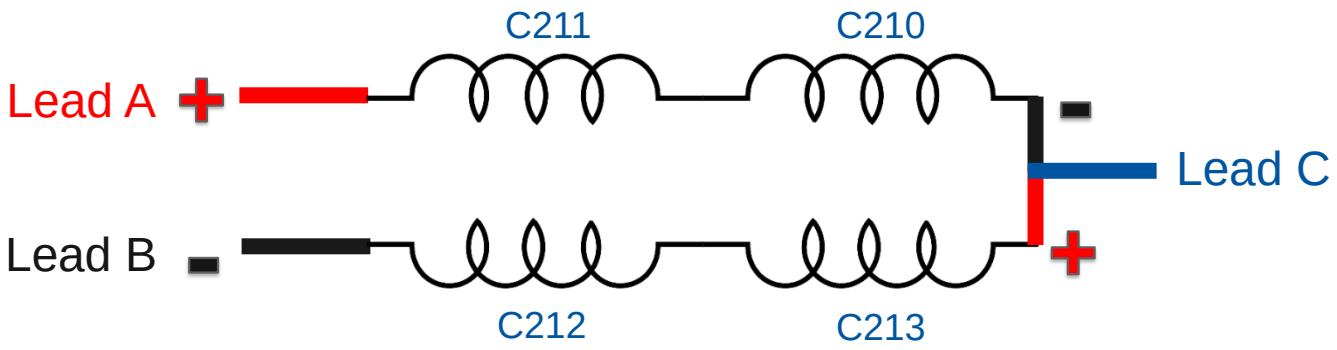
- Cooldown/warmup
  - dT < 50 K
- 3 current leads
- 30 kA power supply

- Protection:
  - Base line protection: R_dump: 60 mohm
  - OL QH: 900V, 150A
- Quench detection:
  - Potaim – differential signals
    - Single powering: between coils and between coil inner and outer layers
    - Both powering: between apertures and coils
  - VT potaim - I < 6kA, 10 ms @ 500 mV; I > 6kA, 10 ms @ 100 mV

HV test levels

	Warm BP	LHe BP	LHe AP	Warm AP
Coil – GND	1 kV	1 kV	1 kV	500 V
Coil – QH	1 kV	1 kV	1 kV	500 V

*Special HV test in GHe after 2nd cooldown: 200K 3bar 1kV



Test program CD1

Temp	#	Test type	Aperture	Current	Duration
1.9 K	1	Training + 1h holding	AP1, then AP2	nominal	2 d
	2	Training + 4h holding	**both**	nominal	
	3	VI measurement + splices	**both**	nominal	0.5 d
	4	Magnetic measurements	**both**	nominal	2 d
	5	Protection studies*	**both**	nominal	0-6 d
	6	AC loss	**both**	nominal	0.5 d
4.5 K	7	Training verification	**both**	nominal	1-2 d
	8	VI measurement	**both**	nominal	
	9	Ramp rate	AP1, then AP2	nominal	
1.9 K	10	Training + 1h holding	AP1, then AP2	ultimate	2 d
	11	Training + 4h holding	**both**	ultimate	
	12	VI measurement	**single or both**	ultimate	1 d
	13	Ramp rate	AP1, then AP2	ultimate	
4.5 K	14	Training verification	**both**	ultimate	2-3 d
	15	VI measurement	**single or both**	ultimate	
	16	Ramp rate	AP1, then AP2	ultimate	

Phase 1 – 1.9K **~6 d**
Phase 2 – 4.5K **~2 d**
Phase 3 – 1.9K **~3 d**
Phase 4 – 4.5K **~3 d**

Total: ~14 d

***Protection studies (to be defined):**
- minimum quench energy, (2 days)
- quench heater delays as a function of magnet current, nominal quench heater parameters (1 – 2 days)
- quench heater delay at nominal as a function of heater current (1 day)
- quench integral studies (1 day)

Test program CD2 to be discussed after CD1

Temp	#	Test type	AP powering	Current	Duration
4.5 K	5	VI measurement	**single or both**	ultimate	1 d
	6	Training verification	**both**	ultimate	
	7	Ramp rate	AP1, then AP2	ultimate	
1.9 K	8	Training verification	**both**	ultimate	2 d
	9	VI measurement	**single or both**	ultimate	
	11	Ramp rate	AP1, then AP2	ultimate	1 d
	12	Protection studies	**single or both**	ultimate	2-6 d
	13	Other powering tests		beyond?	

Phase 1: 4.5K **~1 d**
Phase 2: 1.9K **~8 d**
Phase 3: 1.9K **~X d ?**

Total: ~9d

Discussion:
- Powering to short sample limit at 1.9 K?
- High QI studies?

Preliminary schedule

February													March																													
T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S	S
18	19	20	21	22	23	24	25	26	27	28	29	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29
warm preparation			cooldown				cold powering CD#1																	thermal cycle				cold powering CD#2											warmup		

- CD1 ~11d (14d needed), CD2 ~8d (9d needed)
- Actual status
  - Magnet arrived Friday afternoon
  - Warm preparation:
    - HV test: 500, 1000 V passed
    - Insert adaptation: ongoing